Projecting Social Science into Defra's Animal Welfare Evidence Base

A review of current research and evidence gaps on the issue of farmer behaviour with respect to animal welfare

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Glossary

Defra	Department for Environment, Food and Rural Affairs
FAWC	Farm Animal Welfare Committee

PROJECTING SOCIAL SCIENCE INTO DEFRA's
ANIMAL WELFARE EVIDENCE BASE
A review of current research and evidence gaps on the issue of farmer behaviour with respect to animal welfare

Social Science Research Fellowship
Maria Paula Escobar
and Henry Buller

I. EXECUTIVE SUMMARY

This Report presents findings from a social science fellowship responsible for reviewing the current social science evidence on farmer behaviour with regard to animal welfare. The fellowship ran from October 2012 to March 2013.

This Executive Summary has two parts. The first presents key messages about Defra's social science evidence approach and the outline for a social science research agenda on farmers' behaviours around animal welfare. The second summarises the research gaps identified through a review of literature on four specific farmer practices: having a farm health plan; participating in a farm assurance scheme; providing pain relief and treating lameness.

PART ONE: SOCIAL SCIENCE IN DEFRA

1. The current social science evidence on farmer behaviour with regard to animal welfare was examined through **a series of literature reviews**. The reviews examined *first* the relevant Defra in-house documents and commissioned reports, *then* the wider academic social science on farmers and *finally* the available literature on four specific farmer practices related to animal welfare: farm health planning, participating in assurance schemes, providing pain relief and treating lameness. Part One draws primarily on the first two reviews and the case studies only to identify evidence gaps. Part Two draws on the literature from the four case areas while serving also as a more practical illustration of the points made in Part One.
2. Defra's current social science evidence base focuses on the internal factors that some social science approaches view as determining people's intention to act, for example attitudes, values, beliefs and knowledge and on evidence on how to affect these factors. For these approaches **behaviour is an outcome**.
3. This approach to behaviour limits the methodologies and the potential of social science research to ask different policy-pertinent questions. By limiting the questions asked by social science to issues about attitudes, values and knowledge, the potential contribution of social science evidence to policy-makers is also limited to, for example, target-tailored communication and knowledge transfer strategies. The wider context in which farmers take actions and decisions therefore remains out of scope for both evidence planners and policymakers.

4. The report suggests enhancing the evidence base with social science approaches that understand behaviour not as a pre-determined outcome but as the social interaction through which, for example, farmers construct their identity, build their sense of professional community, relate to a wider set of stakeholders and to culturally embedded ideas about farming.
5. The authors suggest that a focus on **behaviour as social interaction** would support a shift in policy interventions to improve animal welfare. Rather than building the blue-print of the "perfect farmer" by aiming to influence their minds, interventions could seek to have an impact on the social interactions and the cultural context within which farmers take actions and decisions. In this way, whilst the legal responsibility for animal welfare remains with their keeper, policies to improve standards of welfare could encompass a collective effort where responsibility for changing farming practices does not lie solely with any single agent but places the farmer at the centre of a range of interconnecting relationships.
6. **Three main areas for further research** emerge from the case studies:
    - farmer – vet relationships
    - the relations with audit and inspection regimes
    - the role of cultural ideas about farming in farmers' actions and decisions.
7. On the basis of our own expertise, we suggest five other themes to assemble a **social science research agenda**:
    - understanding society's interpretations of animal welfare;
    - understanding the lessons emerging from experiences of behavioural change where farmers are active participants, that are targeted at farmer communities rather than at individuals and/or are based on building consensus through dialogue, rather than being top-down interventions;
    - understanding the influence of affect, care and empathy within human-animal relations on farmers' actions and decisions;
    - understanding farmers' practices of record-keeping and record-usage;
    - understanding the lessons learned from other areas where voluntary and non-regulatory approaches have been implemented, such as agri-environment schemes and climate change adaptation and mitigation strategies.

PART TWO: CASE STUDY SUMMARIES

HAVING AND USING A FARM HEALTH PLAN (FHP)

This review indicates that farmers' decision to have and actively use a FHP takes shape through the various relationships in which they operate. Their relationship with their vet is both a driver and a barrier. The research indicates that although a close farmer-vet relationship increases the likelihood of farmers having and using a FHP, farmers seem reluctant to see veterinarians getting actively involved in farm management decisions. In addition, while assurance schemes have driven the uptake of FHPs, there is an indication that audit regimes associated with such schemes could contribute to FHPs being perceived as mere paperwork while placing less emphasis on the active use of FHPs for making management decisions. For FHPs to more strongly drive the desired practice of planning, the evidence suggests that a collective consensus between their advocates, users and auditors on how they are meant to be used would be required. These interpretations of the literature, however, need much further investigation. We suggest exploring a shift in the framing of the issue of farm health plans from encouraging farmers to have a FHP to developing a collective (all stakeholders) understanding of FHPs as a process –rather than a document- that farmers perceive as integral to their professional pride and identity.

EVIDENCE

- Having a written plan and using it to inform decision-making are two different practices. Not all farmers who have a plan make active use of it and not all farmers who collect data and use it to inform their decisions do so on the basis of a requirement from assurance schemes or other bodies
- Uptake and usage of FHPs varies across sectors and farm size
- Farmers frequently seek the support of vets in drawing up a plan, but are less comfortable with vet's efforts to encourage the active use of FHPs. There are indications in the literature that FHPs might be perceived as an intrusion (by vet and/or government) in a farmer's sense of knowledgeable autonomy and management independence
- The links between FHPs and improved productivity, health or welfare are not always apparent to farmers and thus these outcomes don't always act as drivers for farmers to keep and use a FHP
- There is some evidence that the main driver for developing FHPs is compliance with assurance schemes. However, to an extent that needs to be determined, FHPs may have become a 'tick-box exercise', affecting farmers' engagement with the idea of keeping and using FHPs as a useful farming practice
- Although it requires further research, the literature also indicates that record-keeping seems to be seen as an end for compliance purposes rather than as a means for analysis, decision-making and progress review, or as benefitting someone else while costing/wasting time, rather than as a means for analysis, decision-making and progress review.

RESEARCH GAPS

- Further investigation is required first on the manner in which the differing understandings of the role of FHPs impact on them being perceived as mere 'tick-box exercises' or otherwise and second, on the impact of variable FHP requirements on specific animal welfare aspects
- In-depth qualitative evidence is required to understand why some farmers voluntarily collect and use data (and on what factors) to improve welfare, without external requirements. Record-keeping and record-using practices need to be better understood
- Our interpretation that farmers might perceive FHPs and those who encourage their active use as conflicting with their sense of autonomy and management independence warrants further investigation
- The differences in uptake and usage of FHPs across sectors and farm size need to be better understood
- The farmer – vet relationship as pivotal for uptake and active use of FHPs. The intricacies and complexities of this relationship in general and with regard to FHPs in particular require further research
- That FHPs may have become a "tick box exercise" is indicative of farmers understanding compliance as "at the moment of inspection", rather than as an active and permanent process of farm management. It is important to understand how the disparities in welfare standards, quality control systems and auditing and assessment mechanisms across different industry FHP requirements have contributed to reinforce this view of FHPs amongst both farmers and industry. It is crucial to understand these audit and inspection dynamics and how all the stakeholders involved participate in shaping this view about FHPs
- Experiences when farmers have developed and applied their own understanding of what a FHP should incorporate need to be investigated

PARTICIPATING IN A FARM ASSURANCE SCHEME (FAS)

While FASs have emerged as important tools for the achievement and improvement of animal welfare standards, the evidence reviewed indicates that this potential is not always fulfilled. The evidence indicates that farmers' decisions to participate in FASs is related to their expectations in terms of benefits such as access to markets and better prices. How these benefits and their associated costs are distributed across the food chain is in turn related to stakeholders' contrasting expectations about the role and purposes of schemes. How these contrasting expectations and benefit/cost distributions affect farmers' participation in FAS and specifically their commitment to animal welfare as a component in FASs needs to be investigated so that uptake of schemes effectively translates into tangible impacts in terms of ensuring/improving animal welfare. There are sector and scheme differences that ought to be fleshed out in research. Other drivers suggested by the literature, such as commitment to particular farming practices or a willingness to demonstrate professionalism also need to be investigated. We argue that research evidence is needed to underpin a broader food chain consensus on the role of schemes with respect to promoting welfare and nurturing farmers' sense of professional pride and individualised benefit.

EVIDENCE

- Farmers have different expectations about the benefits of participating in FASs and these vary by sector, scheme and farmers' ideas about and degree of engagement with animal welfare. These differing expectations include the validation of professional practice, ensuring access to the market, obtaining premium prices, fulfilling a commitment to animal welfare and demonstrating compliance.
- Views about the role and purpose of FASs vary too amongst other stakeholders. For retailers, FASs are about competitive segmentation, due diligence, customer loyalty and brand marketing; for industry, FASs are about meeting and in some cases exceeding minimum standards; and for the policy sector FASs are about developing market-driven standards and communicating welfare to consumers.
- Although limited, there is some evidence that some farmers see these variations in the perceived role and purpose of FASs as producing an imbalance of power that disfavours them in the distribution of accreditation costs (such as time, money, increased paperwork and stretched labour availability) and benefits.
- There is some evidence of feelings of disillusionment and distrust amongst some farmers with regard to the commitment of retailers and consumers to sharing the costs and benefits of ensuring and or improving animal welfare. The extent of these feelings and perceptions, as well as their effects on FAS uptake and effectiveness as well as on farmer commitment to animal welfare needs to be established through further research.
- Complaints about inconsistent monitoring of schemes and perceived unfairness in inspection/certification process and their effect on uptake, commitment and effectiveness warrant further examination.

- There are differences in the weight that different schemes give to specific welfare issues. Further research would allow an understanding of how this relates to farmers' own differentiated commitment to these issues.
- While farmers' views about the financial benefits of FAS membership vary, the literature suggests that other benefits, such as demonstrating compliance and commitment to animal welfare are also (and sometimes more) important for farmers. Research needs to investigate these other drivers.

RESEARCH GAPS

- There are good indications that ideas about what being a 'good' farmer means have an effect on the uptake and effectiveness of assurance scheme membership. However, the evidence is limited and further research is required to examine what ideas circulate within farming cultures around FAS accreditation, disqualification or withdrawal; what kind of social norms are involved in assurance membership, how they influence uptake and how these cultural ideas vary across sectors
- There is some evidence on the pig and beef sectors, but there is a need for research on other sectors and for cross-sector studies
- Research is needed to establish how FAS membership is different from other forms of regulation in terms of ensuring/improving animal welfare
- The disparities in the expectations that different stakeholders have from FASs –as implied by the literature - and their consequences on uptake of and commitment to FASs as well as on FASs' effectiveness in terms of ensuring/improving welfare warrant further investigation. This would need to recognise important differences across the multiple schemes and the different livestock sectors
- The literature indicates that farmers perceive the processes whereby the practices and regulations that are included in schemes are set as very "top-down", and that they would prefer a more participatory approach. Research is required on how the rules of schemes are constructed and on alternative more participatory approaches
- The literature indicates that it is possible that the fact that the separation of inspection from advisory roles in FASs might have the effect of encouraging farmers to view FAS as bureaucratic rather than management activities. Further research is needed to understand the effects of the disconnection between inspection and advice
- The competitive standard setting common in retailer assurance schemes leads to changing rules and conditions for producers and this has been identified as a possible barrier to greater uptake, but more research needs to be done on this
- Drivers other than financial benefits need to be better understood.

PROVIDING PAIN RELIEF (ANALGESIA/ANAESTHESIA)

Farmers' decisions about providing pain relief to their animals understandably vary according to procedure or condition. However, these decisions are also strongly influenced by farmers' relationships with vets, by vets' decisions about offering pain relief options, by on-farm structural limitations (such as the availability of separate hospital pens, for example), farmers' feelings of empathy with their animals and farmers' management priorities at a herd level. Shared notions about pain and pain relief that circulate within farming cultures also have a role to play. This complex decision tree is nevertheless under-researched from a social science perspective.

EVIDENCE

- The decision to provide pain relief has traditionally been understood as an outcome of perceptions about how painful a condition/procedure is and how beneficial the anaesthesia/analgesia will be for the animal's welfare and productivity. In general, farmers have a high degree of awareness of the level of pain associated with some procedures/conditions. Levels of agreement about the benefits of pain relief are also high.
- However, research shows that provision of pain relief by farmers and vets is inconsistent. The available social science indicates that the decision tree involves more than perceptions about pain and the benefits of pain relief.
- Several myths circulating in the farming community about animal pain influence farmers' decision to provide pain relief to their animals, for example that young animals experience less pain than adults, that a certain level of pain is necessary to prevent movement and that analgesics mask signs of further deterioration.
- Although cost is often mentioned as a barrier to providing pain relief, the evidence indicates that farmers are more willing to pay for pain relief than vets expect. Cost, however, is more relevant in the decision if the pain relief is required for longer periods.
- The farmer-vet relationship emerges as an important vector. There is the suggestion that vet perceptions about farmers' attitudes to pain relief and willingness to pay for it affect their decision to offer pain relief options. Vet knowledge about pain relief options is also a key factor in vets' decision to offer options for pain relief to farmers.
- Farmers' decisions to provide pain relief are also affected by ideas that circulate in farming cultures about some painful conditions being 'normal' and certain practices being part of what farmers 'have always done'; about the balance between causing short term pain and subjecting the animal to long periods of stress in order to receive pain relief; about the skills and risks associated with providing pain relief and about harmful residues and withdrawal periods. Other ideas about the individual animal, about the well-being and productivity of the herd and feelings of empathy and attachment are also part of the decision-making process.

RESEARCH GAPS

- More evidence on actual use of pain relief by farmers and vets needs to be collected. The surveys that have been done allow variations such as "in less than

25% of cases", "in over half the cases", but do not offer any insight into what explains these variations on-site.

- The apparent incongruity between perception of pain, willingness to pay and actual use warrants further investigation.
- The incidence of vet perceptions about farmers' attitudes to and willingness to pay for pain relief on their offering of pain relief options ought to be investigated.
- The evidence indicates that the decision to provide pain relief is very complex. Research is needed to understand this complexity and how it varies across sector, system and procedures/conditions.
- It is necessary to understand how issues of empathy, sense of professionalism, cultural ideas about pain and pain relief ownership (whether the farmer or vet thinks it is their decision) affect the provision of pain relief.

TREATING LAMENESS

This review suggests that the barriers with regard to lameness control revolve around culturally embedded ideas and farming practices that reinforce each other. These ideas include the notions that lameness is very hard to control, that a certain level of lameness is normal and un-avoidable and that lameness becomes a welfare issue at the herd and not the individual level. The motivators also appear to be related to ideas about professional pride, empathy and reputation. Research is required to facilitate interventions that address this connection between practices and ideas and seek to embed, through changes in the choice of treatment, the idea that lameness is treatable.

EVIDENCE

- Dealing with lameness implies different decisions: from recognising to treating it; from acknowledging it as an issue that requires treatment to considering it a welfare priority; from preventing it to supporting animals in their recovery after treatment
- The evidence indicates that these decisions are affected by at least two ideas that circulate in farming communities: that lameness becomes an issue that requires treatment at the herd and not the individual level and that a certain level of lameness is acceptable and inevitable
- The evidence suggests that these ideas persist in a cycle of mutual reinforcement with their associated practices: ideas determine decisions about treatment and in turn the choice of treatment reinforces those ideas
- Research shows that although the cost of lameness is well-documented and information is accessible, there are issues of trust, legitimacy and transparency that prevent this information from acting as a motivator for farmers
- The idea that a certain level of lameness is acceptable is linked to the idea that lameness is very difficult to control. The choice of suboptimal treatments reinforces these ideas
- The fact that farmers judge when lameness becomes an issue that requires treatment when they think of it at the herd and not the individual level is linked to differences between farmers and vets in judging when a cow is lame. The farmer-vet relationship is key in various ways and at different points of the decision map described above, but further research is needed to understand these nuances, for example in farmers' choice of suboptimal treatment
- While farmers' lists of barriers to treating lameness include the perceived inaccuracy of the evidence of economic impact of the condition, their lists of drivers point to cultural and emotional issues such as professional pride, empathy and concern for reputation.

RESEARCH GAPS

- The feelings about the legitimacy and transparency of the available figures on the cost of lameness need to be investigated in order for cost to act as a motivator
- The cycle of culturally embedded ideas about a certain level of lameness being acceptable and about lameness being hard to control, which are reinforced by farmers' choice of treatment, needs to be thoroughly understood

- Farmers' motivations to choose suboptimal treatments need to be better understood
- Farmers' relations with other actors, such as foot-trimmers and how they affect farmers' approach to lameness, choice of treatment and how they relate to circulating cultural ideas about lameness also requires further investigation
- Research is needed on the cultural ideas about lameness that circulate in farming communities and on motivators related to professional pride, empathy and reputation.

II. BACKGROUND

8. Improving the welfare of farm animals has long been a key government policy in England. The commitment to farm animal welfare was stated in Defra's 2012-2013 Business Plan priority to "Support and develop British farming and encourage sustainable food production … [by enhancing] the competitiveness and resilience of the whole food chain, including farms and the fishing industry, to ensure a secure, environmentally sustainable and healthy supply of food *with improved standards of animal welfare*" (Defra 2012a, p.2, our emphasis).
9. Maintaining and improving the welfare of farm animals within livestock systems is a critical element to farm productivity. Poor welfare is not economically sustainable and higher standards of welfare bring identifiable economic benefits (FAWC, 2012).
10. Beyond their immediate economic function, as the then Secretary of State for the Environment Owen Paterson explained at the Royal Society event on the Natural Capital Committee, animal health and welfare must also be recognised as factors that support the longer term value of Britain's landscapes and biodiversity (Paterson 2012).
11. Improved welfare standards are driven by professional standards, codes of recommendations, competitive market forces and quality assurance and accreditation schemes. The last twenty or so years have seen a substantial growth in the body of legislation and regulation addressing the issue of farm animal welfare, coming from the European Union and from the Government. Reducing the regulatory burden on the agricultural sector to encourage competitiveness, growth and shared responsibility are now emerging as central policy priorities within government (DEFRA 2012a) and extend into the field of animal welfare. The Farm Regulation Task Force (Defra 2012b) has recently recommended the broad prioritisation of non-regulatory solutions with the aim of encouraging the industry to take responsibility and develop voluntary initiatives that encourage positive behaviour through earned recognition systems, continuous professional development, and co-design of implementation and intervention tools.
12. Against this background of relatively high-levels of regulatory and legislative 'base-line' in England, political concern has grown, in certain areas, that the higher welfare standards and regulated practices are potentially placing the economy at a disadvantage in the global market. Coupled with this has been a governmental desire to reduce what is seen as the prohibitive administrative burden of a wide-ranging regulatory governance regime. Consequently, alternatives to regulation (including voluntary Codes of Practice, Standard Operating Procedures and behavioural change) are being actively sought in a number of policy areas, including farm animal welfare. In

parallel to the drive for better regulation, there has been a dramatic growth of private regulation within the agri-food sector and the major retailers in particular, as they seek to establish consumer confidence and loyalty to a brand as well as competitive standard levels through product segmentation. There are a large number of different private certification and assurance schemes including the RSPCA's Freedom Foods scheme, the industry's Red Tractor assurance scheme and the numerous certification schemes adopted by individual retailers. While Government might seek to reduce the regulatory burden, both on farmers, as the subjects of that burden, and on itself as administrator of that burden, the reality for many in the agricultural profession is that the regulatory burden as a whole has dramatically increased in recent years. It is only the source (and for some, the legitimacy and intentionality) of that burden that has altered.

13. This increase in non-regulatory and voluntary mechanisms encompassing shared responsibility necessitates a better understanding of the vectors that influence farmers' decisions about their farming practices.

14. Although there has been a significant amount of research over the years into farmer attitudes, behaviour and actions in the take-up of both regulatory and voluntary approaches to different policy challenges (from the adoption of agricultural improvements and innovations in the 1950s and 1960s, through compliance with regulatory environmental minima in the 1970s and 1980s to the sign-up to voluntary agri-environmental schemes in the 1990s), there have been remarkably few attempts to synthesise this research into an operational framework for assessment and forward development.

15. The 2011-2012 Evidence Plan for Animal Welfare (EPAW) reiterates the sense that there is a lack of evidence "on the barriers existing to uptake by farmers and keepers of the information currently available" (Defra 2011a p.3) on health and welfare-ensuring practices, and suggests that "the work done in other programmes to assess the reasons for uptake (or lack of uptake) of advice on environmental issues may be applicable for welfare and affect the need for primary research" (ibid). The "interactions between welfare and sustainability, climate change and reduction of greenhouse gas emissions, and food security [… as well as between methodologies to] assess the benefits delivered by improved welfare in terms of value to society" (ibid) are also areas where Defra has identified evidence gaps. The "uncertainty as to why animal handlers do not adopt changes that have been proven to improve welfare" (ibid, p. 5) was also noted as a research gap in the 2010 peer Review of the Animal Welfare Research Programme, and this underpins the EPAW's "need to conduct more social science research to understand how best to communicate evidence and effect behavioural change, linking to lessons learned and information available on the environment side" (ibid). In summary therefore, four specific areas of evidence need have already been identified by Defra:

    - Evidence on the barriers to farmer uptake of health and welfare measures
    - Evidence of the potential for lessons to be learned from studies and experience of uptake in other policy areas (notably, environmental policy)
    - Evidence of identifiable 'gaps' in the existence, provision and transmission of knowledge and information which act as further barriers to farm level uptake

- Evidence of the best ways to communicate information and affect behavioural change.

16. The remit of this report was therefore to examine the current social science evidence on farmer behaviour with regard to animal welfare by integrating a short list of key animal welfare behaviours and unpicking the vectors that influence farmers' decision-making from a social science perspective. In doing so, the report was expected to identify key evidence gaps and make suggestions about how best to satisfy them.
17. Following this introduction, the Methodology section provides further details of how we proceeded. The Key Messages summarise our results. Section V reflects the generic literature review that constitutes the basis for Key Messages 1-3 about the current framing of the issue of farmer behaviour in the Department, its limitations in providing comprehensive evidence to develop more successful interventions to improve animal welfare and the profile of an alternative approach. Sections VI-IX present the case-study[1] literature reviews through which the key research areas discussed in Key Messages 4-7 emerged.
18. Each case study is presented first as an Evidence Review, which synthesises and organises the literature while highlighting detailed and issue-specific research gaps, and then a two page Summary, identical to the summaries presented for each case study in the Executive Summary above and reproduced only to make the report readable as independent blocks.
19. The last section brings together the case-study findings into a short list of concluding remarks that set up the basis for a social science research agenda that, albeit focused on animal welfare, has nonetheless the potential to be extended into other farmer-related policy areas within the Department.
20. In order to make the bibliographical references more accessible and practical we have distributed them as follows.
    - The list of Internal References includes all the literature produced in-house or commissioned by Defra.
    - Given the substantial amount of references reviewed, in order not to compromise the narrative flow of some paragraphs, particularly in Section V, we have created thematic sub-lists of References which we have numbered. That is, instead of listing all the references pertinent within a paragraph, we have directed the reader to "Reference List –and a number–". These lists, as well as all the other references cited within the text are included under References at the end of the Report.
    - Finally, each case study has its own list of Key Literature to make each case study readable as a whole without the reader having to search the main list of references.

[1] We refer to the literature reviews on specific farmer practices as case studies only to make the language of this report easier to understand but they were not case studies in the rigorous academic sense as they did not involve any primary research

III. METHODOLOGY

21. The brief for this research was to build on the internal work already done by Defra on understanding farmer behaviours. Reviewing this literature systematically allowed us to identify the various theoretical approaches that Defra has employed to date, assess Defra's notion of "behaviour", and evaluate the manner in which social science evidence has been used to underpin approaches to farmer behaviour in the delivery of farm animal welfare policy and actions.
22. The next step was to review the wider academic literature on farmer behaviour and social science approaches to its study. Although the emphasis throughout was on UK specific sources, we drew, where appropriate, on international material. Our focus was on literature focusing on animal welfare, but we were also careful to include insights from work on behaviours related to animal health, land management, sustainable agriculture and biosecurity. We reviewed over 250 articles. The reading list was gathered through a series of searches on Google Scholar using "farmer" AND "behaviour"; "farmer behaviour"; and "animal welfare" AND "farmer" AND "behaviour" as words in the text. Relevance was determined to the extent that the article focused on on-farm practices. The indexes of *Sociologia Ruralis* and the *Journal of Agricultural Studies* were reviewed for relevant papers.
23. The review of the academic literature also allowed us to establish an understanding of the more pressing areas of concern for animal welfare policy and the conceptual approaches underpinning strategies for evidence gathering and intervention. In line with the Report's aim to focus on specific animal welfare issues, we then selected a series of case-studies. This was done on the basis of the initial generic literature review and according to three principal criteria: first, they had to be issues that were recognised as contributing to the maximisation of on-farm animal welfare; second, there needed to be sufficient academic literature on these issues, and third, the issue selected needed to offer a voluntary non-regulatory opportunity for improving farm animal welfare. The final selection included having a farm health plan (hereafter FHP), participating in an assurance scheme (hereafter FAS), providing pain relief (in the form of anaesthesia or analgesia) and treating lameness in dairy cows and sheep.
24. Our subsequent task was then to carry out specific literature reviews for each of the selected case-studies. This was done through a critical reading and interpretation of the literature, but also through direct contact with issue experts (in the case of lameness). The aim of the case-studies was twofold. On the one hand, they had to fulfil the Report's requirement to provide insights on the drivers and barriers to specific practices related to concrete animal welfare issues; on the other, they offered an opportunity to examine and illustrate the potential both for Defra's evidence base and policy intervention options, of reframing the issue of farmer behaviour as suggested in Key Messages 1 -3. Relevant literature was again gathered from Google Scholar searches using "farm health plan", "herd health plan", "veterinary health plan", "farm assurance", "animal welfare" AND "assurance" OR "scheme", "lameness" AND "farmer", "farmer" AND "pain relief" OR "analgesia" OR "anaesthesia" in respective searches. The searches were limited to papers published from 2000 onwards. Suggested articles within online publication databases were also scanned for relevance.

25. The case studies presented in this report demonstrate how current and recent research into farmers' actions and decisions shows that these are not only related to individual attitudes, values and knowledge but also to the wider set of social, economic and cultural relations in which farmers operate. In this, the case studies reveal the need for Defra to broaden the scope of its social science evidence (as argued in the first part of this Report). The case studies presented here also serve to provide a list of barriers and drivers for specific on-farm practices related to animal welfare.
26. In order to situate this potential within the current priorities of the animal welfare policy team, we also carried out a workshop with its members in which they were invited to listen to our initial findings about the wider scope of social science evidence, and to build and prioritise a list of the behaviours that they considered would have the most significant impact on animal welfare. The insights gained through the workshop are incorporated in Key Message 2.
27. Findings from this Report were presented to policy and evidence teams and this final version has benefitted from these discussions as well as from the very helpful comments of two external peer reviewers.

IV. KEY MESSAGES

1. Evidence from the critical review of literature suggests that Defra's evidence base would greatly benefit from reconsidering the framing of the issue of farmer behaviour as essentially an issue of individual attitudes and knowledge. This would allow the Department to take better advantage of the evidence granted by different social science approaches that conceive of actions and decisions not only as the outcome of individuals' attitudes, beliefs and values, but as instances of wider social and political interactions.
2. While Defra has kept abreast of new concepts, such as social norms, social networks and social learning, it has integrated them as further variables that complement the initial model of attitudes, values and beliefs which nonetheless remains centred on the individual as the focus of research and intervention. Reframing the issue of farmer behaviour as a matter of social interactions would imply engaging with the alternate social science approaches from which these new concepts have emerged.
3. Broadening Defra's engagement with other social science approaches would strengthen the Department's evidence base and potentially inform the development and impact of innovative interventions to influence the individual, social and cultural context in which farmers take actions and decisions.
4. In working towards a non-regulatory approach to animal welfare it is important to understand that from a farmer's point of view, regulation is still regulation regardless of its source (from Government to food chain actors and professional bodies); and that collective, bottom-up experiments of self-regulation ought to be researched and evaluated as an alternative option.
5. While providing a review of the drivers and barriers to four specific animal welfare farmer behaviours as identified in the literature, our interpretation of the case-studies aims to illustrate how a shift towards an alternative understanding of behaviour would allow the Department to build a more robust social science evidence base that underpinned alternative issue framings and intervention options. Understanding behaviour as a social interaction, three key relationships emerged from the case-studies as fundamental to famers' actions, behaviours and decisions:
    - the relationship between the farmer and the vet (and potentially other advisors, such as foot trimmers);
    - the relationship between the farmer and the audit/inspection regimes –and the multiple actors and stakeholders thereby involved; and
    - the relationship between the farmer and the broader cultural and professional communities, with their cultural scripts[2] and traditions.

[2] Here we make specific reference to the concepts of cultural capital and cultural script as applied to the realm of animal welfare by Sutherland and Burton (2011) and Vanclay and Enticott (2011). An example of a cultural script is the culturally embedded idea that a "good farmer" is a productive and efficient farmer. Sutherland and Burton have shown that farmers will make decisions and take actions that allow them to fit into this socially valued model which awards them with "cultural capital", that is, a sense of professional pride and identity that has social and cultural rewards. To the extent that these rewards also have an emotional component, we have also used the term "emotional capital" to refer to how farmers' actions and decisions are related to preserving and fostering these emotions. It is also worth mentioning de Rooij's (2010) notion of cultural repertoires "composed of strategic notions, associated value frameworks, ethical considerations and accumulated experiences that, together, specify how farming is to be organised [...which result in] standards

It is important to note that other case-studies would probably suggest other relations as pivotal, but insofar as these three areas emerged in all of the issues selected for the case-studies, there is reason to expect that their incidence cuts across other behaviours too.

6. While we consider these three evidence areas as the main general topics for a social science research agenda, we identified from our own expertise five other more specific themes to include within the agenda:
   - a better understanding of society's interpretations of animal welfare as a social issue;
   - an evaluation of the literature and lessons emerging from participatory, collective and dialogue-based experiences of behaviour change;
   - a better understanding of the influence of issues of affect, care and empathy within human-animal relations on farmers' actions and decisions;
   - the effect of information demands and information flows on farmers' practices of record-keeping and record-usage.

7. Finally, a fifth theme within a social science research agenda would seek to draw the lessons to be learnt from other areas where voluntary and non-regulatory approaches have been implemented in order to generate changes in actions and decisions, such as agri-environment schemes and climate change adaptation and mitigation strategies.

KEY MESSAGE 1

28. Defra's social science research approach to farmer behaviour is currently limited by its understanding of the issue as the individualised output of a series of internalised variables. This understanding, which is linked to the prevalence of psychology and socio-economic approaches to the problem, loses sight of the contributions granted by other social science approaches that conceive of actions and decisions not only as an outcome of individuals' internal architecture, but as part of the wider social interactions in which they participate and through which cultures, practices, knowledge and power take shape.

29. To date, Defra's approach to the understanding of farmers' behaviours has largely favoured psychology and socio-economic theories, from the early work of Martin Fishbein's Theory of Reasoned Action (TORA) and Icek Ajzen's Theory of Planned Behaviour (ToPB) to their more recent reincarnation in Thaler and Sunstein*s' Nudge* approach. These psychology and socio-economic theories frame actions and decisions at the individual level, and thus seek to explain and predict behaviour as the result of individuals' attitudes, values and beliefs. Thaler and Sunstein*'s Nudge* integrates insights from theories of choice into this focus to demonstrate that free choices can be orchestrated to steer people into making the 'right' decision without constraining their options. These approaches have been widely used within the Department (Defra 2008, 2011b; Pike 2008) and while they provide important cognitive and intervention insights

of 'proper farming' [...and] inform and structure the different domains of the farm into specifically ordered farming practices" (p.342).

and have informed policy intervention in a wide range of contexts, their predominance limits the reach of Defra's potential to achieve its goals through non-regulatory approaches to behavioural change.

KEY MESSAGE 2

30. While Defra has kept abreast of new concepts, such as social norms, social networks and social learning, it has integrated them as further variables that complement the initial set of factors -such as attitudes, values and knowledge- but still within an understanding that remains centred on the individual as the focus of research and intervention. In doing so, the potential evidence and policy implications opened up by the different social science backgrounds where these innovative concepts germinate is not always exploited to its full extent. Reframing the issue of farmer behaviour as a matter of social relations would imply engaging with such alternative social science approaches.
31. At the evidence level, the individual-based framework has implied a research focus on the variables that explain and configure individual behaviour and on the options to influence them. Different approaches lead to different policy frames and options. For example, while Defra's intention was to encourage farm health planning as a strategy to embed the process of monitoring and reviewing animal health and welfare indicators into the everyday running of livestock farms, the evidence suggests that for many, the focus has become more on the 'plan' as a document rather than on 'planning' as a process. This seems to have contributed to the perception of farm health plans as just a tick-box exercise, affecting their take-up and effectiveness. While the socio-economic approach might investigate this in terms of farmers' attitudes and beliefs around the value of plans and the benefits of planning and thus suggest intervention strategies around the communication of the benefits of having and using a plan, an alternate social science approach might seek to understand how the perception of plans as a tick-box exercise relates to and is conditioned upon the wider social and economic contexts in which farmers operate; thus taking account of the place and value of plans and planning within the social interactions in which plan-making takes shape (for example, with vets, auditors, suppliers, other farmers) or the role of plans and planning in farmers' notion of what it is to be a good farmer. Such an understanding of the issue would have the potential to develop other policy options that concentrated less on affecting attitudes and perceptions and more on affecting the operational contexts in which plans become a tick box exercise and the cultural contexts in which they can become a source of professional pride and identity. By making more and better use of these other social science approaches Defra could build a more comprehensive evidence base that paved the way for complementary policy options.
32. At the policy level, the dominant framing of farmer behaviour as an effect of attitudes, values and knowledge, which locates the focus of policy and interventions on the individual has its implications too for policy-making. During a workshop carried out with the policy team, the wider context of social, economic, political, institutional and regulatory relations in which farmers take actions and decisions was somewhat eclipsed by the notion that behaviours are essentially the effect of internalised attitudes, values and knowledge. Participants at the workshop overwhelmingly identified farmers'

attitudes and beliefs towards their animals as the key to improving animal welfare standards and seemed to think that the key to improved animal welfare standards was a change in farmers' attitudes and beliefs towards their animals. After clustering their own list of key farmer behaviours into a few behaviour families, participants voted for the group they considered to be the top priority and "keeper/farmer attitudes" obtained the most votes. An alternative understanding of behaviour not as an outcome of individual variables but as social interaction would have these interactions as the unit of both analysis and intervention.

KEY MESSAGE 3

33. Besides leading to evidence that focuses on measuring and changing the internal variables that explicate behaviours when the latter are framed as outcomes, the current dominant social science approach has also influenced the scope of social science evidence requirements and research methodologies. The grey literature review reveals an emphasis on attitudinal surveys, farmer segmentation analyses and predominantly quantitative studies of farmer values, personal knowledge systems and communication flows.
34. Such evidence is favoured by policy-makers as it is quantifiable and to some extent predictive, which makes it amenable to the perceived requirements of evidence-based interventions. However, this is potentially to the detriment of the richer picture to which other methodologies can contribute, including ethnographies, biographical and narrative approaches, dialogue-based approaches, visual methodologies, event and practice based approaches and in-depth interviews, amongst others.
35. In turn, while individual-based approaches have been very useful to fine tune segment-tailored, knowledge transfer and communication based interventions, the effect of these instruments on the wider social relations that impinge on farmers' actions and decisions is necessarily limited and, therefore, so is their impact on effectuating behavioural change.
36. The research review undertaken here and the research gaps it has identified lead us to suggest that a broader social science research approach could complement existing individual-based behavioural and attitudinal approaches. Rather than focus upon the normative behaviour of individuals as 'change agents', a broader social science approach takes as its centre of attention the social interactions within which farmers' actions and decisions take place and to which their day-to-day practices relate, as well as the social and collective framework in which they are undertaken. Such an incorporation of social science into the evidence base on farm animal welfare practices would add robustness to Defra's framing of the problem and allow the Department to adopt a more holistic approach to the understanding and the modification of practices as they exist *in situ* (Hargreaves, 2011). Moreover, an approach that focuses on interaction as a starting point - rather than the individual - allows not only an understanding of the different ways in which practices are shaped, formulated, and understood, but also the development of a collective approach to changing practices and interactions, thereby extending the range of possible interventions to other relevant actors in the process, whether they be vets, assurance scheme inspectors,

retailers, or policy-makers. Different methodologies ask different questions, and different questions bring about new answers.

37. While these suggestions may appear pertinent at the evidence level, their practical difference at the policy level is not always that apparent. A frequent question asked in a policy-making context is: what difference would it all make? In this report we have strived to illustrate this in the Farm Health Plans case-study by linking the research gaps we have identified to alternative formulations of policy aims as underpinned by a shift in the social science approach.

KEY MESSAGE 4

38. In developing non-regulatory approaches to animal welfare it is important to understand farmers' perceptions of the current regulatory setting. There is indicative evidence that from a farmer's point of view, regulation is still regulation regardless of its source, for example government, food chain actors or professional bodies. Evidence shows that the sources of regulation are, if anything, multiplying at the same time as government is exploring non-regulatory approaches and seeking to remove unnecessary administrative burdens. As we have shown elsewhere (Buller and Roe, 2010; Buller 2013), farm animal welfare offers to retail interests a new terrain for product segmentation and competitive pricing and, as a result, competitive standard setting. For farmers, this implies a new set of possible drivers and barriers. Thus, it is crucial to understand how farmers perceive these changes in the regulatory landscape as well as their impact on farmers' actions.

39. A related concern that farmers often express is to do with the processes through which voluntary regulations and standards are established. There is reason to expect that this concern for the prevalence of a "top down" approach is also present in farmers' perception of how policy interventions are designed, and how knowledge about farming practices is produced. The impact of these farmer readings warrants further research, both on farmers' perceptions of and interactions with these processes whereby welfare outcomes and the mechanisms to achieve them are defined, and on the potential of alternative, dialogue-based interventions. There are examples of collective and dialogue-based, bottom-up experiments of self-regulation but there is little research on their effectiveness. They should constitute another node of further social science research on farmer animal welfare practices.

KEY MESSAGE 5

40. The research review identifies three relationships as fundamental to famers' actions, behaviours and decisions around the issues explored in the case-studies. While other case studies might reveal other key aspects, the relationships identified in this report seem to have an extended impact across various animal welfare issues. A first key relationship is that between farmer and veterinarian. Beyond the role of the vet as a carrier of knowledge and information, already identified in communication strategies, we refer here to how farmers and vets perceive each other, of their different views on

specific issues and of the impact of their working relationship on farmers' actions and decisions. For example, while farm health planning relies for its success on a working partnership between farmer and vet that sees the vet having an active role in farm management decisions, the evidence suggests that this is not how farmers perceive the role of the vet and that they might even be reluctant to see the vet as having an influence on management decisions. In the case of providing pain relief, understanding the farmer-vet relationship is again crucial: the evidence indicates that vets underestimate farmers' willingness to pay for pain relief and decide not to offer pain relief options to farmers whom they think will be unwilling to pay for analgesia or anaesthesia for their animals. A second critical relationship we identify is that between the farmer and audit and inspection regimes. The evidence suggests that the way in which audit regimes operate may contribute to FHPs becoming a tick box exercise for example or to farmers' negative perceptions of FAS, mining away the potential effectiveness of such tools in terms of ensuring/improving welfare and generating cultural changes in farming practices. Finally, there are farming cultures, made up of norms, practices, traditions and ideas, presumably with sector, region and system nuances, to which the farmer relates in its actions and decisions. Research shows that in their day-to-day actions and decisions, farmers relate to these communities of practices and ideas. This is clear in the case of treating lameness in dairy cows and sheep, where there seems to be a link between the persistence of ideas about lameness being hard to treat and beyond the farmer's control and the choice of suboptimal treatments, a choice that is in turn related to notions of lameness as a herd and not individual issue. Practices and ideas reinforce each other. These sorts of culturally embedded ideas also seem to have an effect on decisions about pain relief and on perceptions about the benefits of participating in FASs.

41. While these relationships emerge as clear vectors in farmers' actions and decisions (and other case studies may reveal other relationships to be crucial) the wealth and depth of the literature reviewed indicates that they are under-researched and therefore there is a need for further evidence on how these interactions unfold and how they affect farmers' behaviour and should thus constitute essential headlines in a social science research agenda. There is reason to expect, furthermore, that a better understanding of these relations has the potential of contributing evidence on other specific farming practices.

KEY MESSAGE 6

42. Besides these three main areas of research, we suggest, in no order of importance, another five themes that could assemble a social science research agenda. First, while the nature of animal welfare is clear as a matter of public policy and both natural and social sciences have made important progress in defining the legal, conceptual and practical contours of animal welfare regulations, guidance and interventions, we still think that it is pertinent to ask fundamental questions about how the public (both farmers in particular and the wider society in general) understands the issue of animal welfare. Indeed, the literature reveals not only that farmers have different ideas of what animal welfare implies but that they also have varying ideas of the importance of specific welfare issues. For example, research shows that farmers interpret the notion of

'welfare' in a wide variety of different ways, some aligning it more closely with animal health, others with 'comfort', others still with an association with naturalness. Such differences in definition impact upon the prioritisation of welfare as an issue and upon the choice of strategies to address it (Bock and van Huik, 2007; Kling-Eveillard et al. 2007). As this review has found, farmers relate to cultural ideas, myths and social norms in their actions and decisions; thus there is reason to expect that their complex understandings of animal welfare are not disconnected from wider cultural ideas about animal welfare. Efforts to affect farmers' views on animal welfare require an understanding of what kind of social problem animal welfare is perceived to be, and how this influences farmers' actions and decisions. Second, there is a need to flesh out the lessons from collective-based approaches, aimed at generating change at the collective and community levels, where new practices and norms become socially acceptable. Third, there is also a need to further understand the role of empathy, affect and care as a crucial part of human-animal relations and their influence on farmers' actions and decisions. While there is substantial evidence on the complexity of these relationships (their history, their geographies, their subjectivities and their spatial and environmental politics, for example), there is a need to understand how these relationships have an effect of farmers' day-to-day practices and decisions. Fourth, this review has also identified the issue of record-keeping and information flow as requiring further research. Farmers are required to provide different sets of information to different actors and for various purposes. The impact this has on their perception of the rationale, the productivity and the benefits of keeping records, needs to be better understood. A better understanding of how farmers perceive and relate to these demands, how this affects their record-keeping practices, and how they analyse and use them would provide important policy-pertinent evidence. The fifth theme is described in detail in what follows.

KEY MESSAGE 7

43. Although the issue of farmer behaviour and its role in farm animal welfare is a relatively new area for social science there are two areas where social science research has already made an important contribution to farmer behaviour analysis. The first of these is agri-environmental policy, the second, far more recently, is climate change. We argue that a better understanding of the lessons gained from these other voluntary and non-regulatory approaches to changing actions and decisions is pivotal and should constitute a fifth theme within a social science research agenda.

44. Following EU Regulations 797/75 and 2078/92, both of which introduced the principle of 'public goods' payments to farmers and established co-funding arrangements out of the CAP budget to support measures that actively protected and/or enhanced the quality of the agricultural environment, a considerable amount of research was initiated at the national and European levels. This sought, first, to assess and evaluate the implementation and effectiveness of these new 'agri-environmental' schemes and measures and, second, to understand – and thereby anticipate – farmer engagement (or not) with them, including subsequent changes both to behaviour and practice (for a review, see Buller et al. 2000). Although much of the initial social science research done in this domain followed in the tradition of earlier farmer segmentation approaches

(Wilson 1996; 1997a and b; Hart & Wilson 1998, Morris and Potter 1995) identifying farmers as 'adopters' and 'resisters' and variations thereon (Billaud et. al. 1996; Brotherton 1989; CNASEA 1997; Lemery et al. 1997; Schramek et. al. 1999), later, more sophisticated research, sought to trace the decision making and behavioural responses of farmers in selecting and implementing agri-environmental schemes and measures (Buller & Brives 1999; Buller & Lenormand 1999; Burton et. al. 2006; Burton et. al. 2008; Falconer 2000; Lobley and Potter 1998; Wilson and Buller 2000; Wilson and Hart 2000; Skerrat 1998).

45. Of course there are important differences between formal agri-environmental schemes and on-farm actions for the improvement of farm animal welfare. The former may include some form of payment to farmers, the amount of which is calculated on the basis of income foregone, costs incurred and viable incentive. In general, the cost of actions and behaviours to improve the welfare of farmed animals are not compensated by public funds. Most agri-environmental schemes are focused upon the identifiable intrinsic qualities of landscape features or environmental resources which are recognised as valued public goods. The public good value of animal welfare, on the other hand, is less easily identified or quantified, while animal lives lie at the very centre of the productive farming process. Nevertheless, both are increasingly driven by consumption concerns rather than production pressures. Both are often seen, to a greater or lesser extent, as contradictory to, or in opposition to, farm profitability. Both represent voluntary and non-regulatory forms of policy mechanism. Finally, both rely upon farmer engagement and both require changes in farmer behaviour.

Box A. Key points to emerge from recent social science research into farmer behaviour with respect to agri-environmental schemes and actions.

- Farmer behaviour with respect to voluntary participation in agri-environmental schemes is driven by a complex array of inter-dependent factors and can rarely be said to be solely the result of a single exclusive driver.
- Economic rationality and profit maximization is rarely the sole criteria for engagement but economic reasons more generally are often identified as the principal drivers of participation.
- Other identified factors include: farmer concern for the environment and/or landscape features, professional pride and sense of professional commitment to a 'public good', social and community engagement, family engagement, social responsibility, financial gain, sense of justified reimbursement for the provision of service, and professional desire to display active environmental engagement.
- The weight of these different factors may vary significantly depending on the degree of behavioral change required by adhesion to an agri-environmental scheme.
- Farmers' decisions to participate in schemes are influenced by factors such as farm type and size, tenure arrangements and previous experience of participation.

- High levels of adoption and behavioral change are often associated with the design of schemes that build upon and fit within existing practices, values and farm management concerns.
- Successful regimes of adoption and engagement may depend upon the 'ownership' internalization and appropriation of the scheme by farmers and local actors.
- Where agri-environmental schemes are linked to other forms of territorial management and local product development and marketing, farmer engagement is often more effective.
- Successful behavioural change is often that which is grounded in local knowledge, values and practices. By contrast, where agri-environmental schemes appear to run counter to local practice and knowledge, greater resistance is recorded.
- Lasting and sustainable behavioural change is highly dependent on the attitudes of farmers before entering the scheme, on the types of scheme proposed to farmers and upon the degree to which farmers are involved in the construction and implementing of individual schemes alongside extension services, countryside management structures and environmental interests.
- A good relationship between farmers and scheme operators and advisors is considered an important facilitator of effective scheme operation and farmer engagement.
- The benefits to farmers of participation in such schemes may not always be those intended or anticipated by scheme designers, suggesting the need for flexibility in scheme design and, in particular, in scheme evaluation.
- There will always be farmers and producers who resist such schemes, often out of a strong commitment to either profit maximisation or to the productivist role of agriculture.
- The long-term engagement of farmers, out-running the operation of specific schemes and the financial payments associated with them, will ultimately depend upon the extent to which new behaviours become normalised into individual and social practice. This normalisation can be assisted by the development of territorial (or sector-led), as well as community-based structures of support, dissemination and collective endeavour.

46. More recently, there has been a spate of social science research on farmer behaviour in response to various drivers and barriers linked to the phenomenon of climate change and to strategies of mitigation. We suggest that another element in a social science research agenda examines the possible lessons from this research for the domain of farm animal welfare.

V. SOCIAL SCIENCE'S CONTRIBUTION TO UNDERSTANDING FARMER BEHAVIOUR

47. Rural social science has been intricately associated with the processes of agricultural change. From the middle of the last century onwards, when intensification, mechanisation and concentration became the dominant paradigms of modernisation and generated dramatic changes in agriculture, understanding; in order to promote the adoption of new technologies and new behaviours to increase productivity and efficiency in farming; emerged as a key objective for rural social research. For many, the core project of rural sociology became that of understanding how and why farmers made decisions about adopting new technologies and farming practices.

48. Drawing on previous work by the rural sociologists Ryan and Gross (1943) amongst others, the American rural sociologist Everett Rogers formulated the concept of *Innovation Diffusion Theory* in the early 1960s to explain the process by which new practices, behaviours or technologies are adopted. Distinguishing four stages: *innovation* (as positive perception of something new and worth doing), *communication* (the means by which information is transmitted), *time* (the period from perception to adoption) and the *social system* (as the innovation becomes accepted as norm), *Innovation Diffusion Theory* highlighted the importance of integrating a communications strategy into the design of policy interventions, and largely underpinned the subsequent development and use of both private and public agricultural extension services in the promotion of new technology and behavioural change. Getting farmers to change and adopt new practices became a matter of transferring knowledge and transmitting messages through optimised communication strategies.

49. Innovation adoption was thus conceived as a complex individualistic process where how knowledge is communicated is seen to have an effect on how it is subsequently processed and interiorised. However, this individualistic complexity, as segmentation theory would argue, can be clustered into wider categories that are useful streamliners for policy-makers, and hence segmentation studies became another dominant approach. Indeed, also an early pioneer of segmentation theory, Rogers developed categories of respondents' behaviour, ranging from 'innovators' and 'early adopters' to 'laggers' and 'late adopters'. These segmentation models were built around attitudinal priorities that elaborated on Ashby's work in the 1920s, which sought to explain farmer behaviour as a negotiated balance between four attitudinal variables: the desire for economic gain against the fear of economic need, the hope of reward against the fear of punishment, honour and recognition against shame and, finally the need for occupation and the pleasure in activity. Gasson's work in the 1970s (for example, Gasson 1971) drew out four 'value orientations' that guided farmer behaviour: the 'instrumental' (making money, expanding business), the 'social' (prestige, supporting the family, maintaining a tradition), the 'expressive' (self-respect, creativity, responding to challenges) and the 'intrinsic' (independence, enjoyment of work tasks, lifestyle preference). Significantly, she found the fourth of these (the 'intrinsic') as the largest group. Both Ashby and Gasson's work concerned farming in general as an activity. A little later, the seminal work of van der Ploeg (1994) introduced the notion of 'farming styles' as specific configurations of farming practice that tie together "the social, the

material, tying together land, labour, livestock, machines, networks, knowledge, expectations and activities" (van de Ploeg, 2010, p.2). DEFRA has produced its own farmer segmentation study (Pike 2011) and identified five farming styles: 'custodians', 'lifestyle choice', 'pragmatists', 'modern family business' and 'challenged enterprises'. In 2005, ADAS Farmers' Voice Survey identified four categories: 'flexible', 'strategist', 'dedicated producer', 'environmentalist and survivor'. Within the field of farm animal welfare, a number of studies have sought to segment farmer attitudes towards welfare practice into identifiable styles as a basis for targeting more effective policy and advisory interventions (for example: Lund et. al. 2004; Kling-Eveillard et al. 2007; van Huik and Bock 2007; Kauppinen, 2010; Kielland et al. 2010). Building on the literature on farming styles, de Rooij et.al (2010) have identified five discourses and associated practices into which to categorise Danish farming styles: the entrepreneurial discourse, the farmers' discourse, the idealistic discourse, the constructivist discourse and the dialogue-centred discourse. Significantly, much of this work has taken place in Continental Europe and notably in Scandinavia. Segmentation has proven to be particularly useful in farmer behavioural research and has been widely used as a mechanism for understanding farmer responses to technological innovation and policy change (Vanclay et al. 2006; van de Ploeg, 2010). As an approach, it is not without limitations, particularly in the translation of established categories into policy interventions and in the ethical concerns that can emerge from tailoring policy responses to established categories of farmers (Barnett & Mahoney, 2011).

50. Deriving policy on the basis of diffusing innovation and transferring knowledge from those who 'create' it to those who 'act' upon it was central to innovation diffusion; the underlying tenet being that farmers make rational, profit-maximising decisions and that all that is needed is to adequately provide them with the right information. Yet, this assumption, as well as the emphasis it places on knowledge communication, attracted criticism. On the one hand, innovation diffusion and knowledge transfer does not always work. Major advances in the knowledge base in animal health and welfare, for example, do not always inform practical knowledge to result in improved husbandry practices (FAWC 2011). On the other hand, critics have also taken issue with the emphasis on communication and with the top-down linearity of communication strategies as a method for achieving behavioural change (for example Stephenson 2003). Further, a more radical criticism came from rural social scientists who studied the consequences of innovation diffusion as a normative project not so much of agricultural modernisation and positive behavioural change but of capitalist restructuring and reinforcing of the vertical segmentation of the production system within which farmers occupied the bottom rung (for example, Hightower, 1972).

51. Increasingly aware of the discontinuity between attitudes and action, between the availability of information on achieving improved outcomes and the choice to operationalise that information into voluntary behavioural change, policy-makers turned from the mid-1980s onwards to attitudinal change models derived principally from psychology and economics. The Theory of Reasoned Action (TORA) was the first of these models to be widely adopted (Ajzen and Fishbein 1980). The focus here is on intention and the factors that influence a person's intention to take action, defined as their *attitude* towards the behaviour in question, the importance (*value*) they give to the

behaviour, and their *beliefs* about what adopting the behaviour implies. Understanding attitudes, values and beliefs -and hence intention-, allows a more accurate prediction of the likelihood of behavioural change. A variant on TORA, known as the Theory of Planned Behaviour (ToPB) introduced a further dimension to intentionality (Ajzen, 1991): a person's intention to behave in a new way will also be guided by their social context, by perceived social norms and their perception of how that action will be received by those people they consider important to them.

52. These theoretical approaches understand behaviour as an outcome, determined at the individual level by a set of internal variables that guide individuals in their actions. To the extent that these variables are identifiable (surveys being the preferred methodology), can be affected through external interventions (knowledge transfer, optimised communication, tailored advice) and are presumed to have results that can be measured and quantified (through post-hoc and ex-post surveys and evaluations), these individual-based approaches have become highly attractive to policy-makers, not only as a mechanism for predicting behavioural change but also as a methodology for achieving it (References List 1). Over the last 20 years, they have grown in complexity as other components of the attitude-behaviour-change dynamic are added, including research on information management (Atkinson 2010; Blackstock et.al 2010; Magne et.al 2010; Sligo and Massey 2007) and on the essential capabilities that need to be established so that behavioural change can be accomplished (Dwyer et. al 2007; Wylen et. al 2010). Other more advanced models of planned behaviour and reasoned action have sought to address the influence of external inputs on individuals' mind maps (Edwards-Jones 2006; Jongeneel et .al 2008; Midmore et.al 2001; Wilson 1996; 1997a and b), sometimes making more emphasis on the effect of structural, economic and financial circumstances (Hendrickson and James 2005; Marley et.al 2010), and more recently on individuals' assessment and understanding of risk (Greiner et al 2008; Nettier et.al 2010). This framing of behaviour as an outcome has also been explored using other models (Barnes et.al 2009; 2012; Herzfeld and Jongeneel 2012; McCown 2002a, 2002b; Toma et.al 2012), including bio-economics (Janssen and van Ittersum 2005); agent-based modelling (Rounsevell et.al 2012); and decision-making theory (Ilbery and Hornby 1983; Farmar-Bower and Lane 2009). Finally, the attitude-behaviour-change dynamic has also been explored not in order to render behaviour changeable, but in order to explain ongoing transformations in farming systems and land use (e.g. Garcia-Martinez et al 2009). However, even though the models might have taken on board such influences as social networks, institutional frameworks, trust and so on, these are considered primarily as external variables acting on individual behaviour in a pre-determinable, bendable and therefore predictive way. And it is because of these characteristics that the models have been favoured by evidence-based policy-makers, allowing them to design, plan and anticipate behavioural change.

53. However, from the perspective of rural social science, these models have various limitations (Ruttan 1996). One is their emphasis on the individual as loci of behaviour. Another is their framing of behaviour as an essentially pre-determinable end-product that originates in the individual's mind-map. A third complaint is the extent to which such framing implies giving less weight to the role of collective traditions, local cultures, alternative 'lay' knowledge, social norms and power relations.

54. The recent resurgence of these approaches in Thaler and Sunstein's '*Nudge*' (2008), which seeks to "alter people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives" (p.8), by targeting the "choice architecture" about which behavioural decisions are made, and its dominance as a normative interventionist strategy within the British Government (House of Lords Science and Technology Committee 2011), has spun further critiques. In the first instance, critics have taken issue with the extent to which these paradigms of psychology and economics marginalise alternative analyses, particularly those of other social sciences which cast their focus beyond the individual and onto the wider social determinants of people's actions and decisions. A further complaint is about the de-collectivisation of responsibility, which under the nudge approach -and the behavioural angle in general- is placed with individuals, "recast as bundles of problem behaviours, at the expense of any examination of the social, cultural and economic circumstances in which those individuals live" (Mair 2011, p. 129). It has also been argued that this shift in the loci of responsibility has consequences for the perceived role and nature of the state and its citizens, and on the very purpose of public policy, targeted at individuals, often segmented, in detriment of the 'social' character of social policy. Finally, critics have also argued that the dominance of these approaches is functional to a neoliberal transformation of the state and thus, insofar as this interlock between research approaches and public policy has an effect on the kind and breadth of evidence that informs the basis of policy-making, the comprehensiveness of such evidence base has also been questioned (Reference List 2).

55. By contrast to the individual-based approaches, recent work by sociologists, geographers and other rural social scientists has re-emphasised the importance of the wider social, structural and environmental factors to which people relate when they take actions and make decisions. The crucial difference is that from a social science perspective, (although other streams in psychology have also made this point, e.g. Michel-Guillou and Moser 2006), behaviour is not understood as an outcome, but as an instance through which farmers relate to their local and professional communities, build their professional, cultural and personal identities and relate to the institutional, economic and political context in which they farm (References List 3). In other words, behaviour is not an effect pre-determined at the individual level but the substance of ongoing social relations, through which farmers relate to other actors and participate in wider social interactions; including their own and very complex relations with their animals, with whom keepers have relationships of care that are co-constructed by both the human and the animal (Bock et.al 2007; Fraser 2009; Hovi and Bouilhol 2000; Porcher 2011; Würbel 2009; Yarwood and Evans 2006). This understanding of behaviour as a matter of social relations has been put to work in evaluations of policy interventions (References List 4), - including cross-national ones at the European level (e.g. Ingenbleek et.al 2012) - as well as in efforts to design alternative policy initiatives to improve animal welfare, some of them based on the notion of welfare as experienced and addressed by the animal itself (Désiré et.al 2002; Manteuffel et.al 2009; Wells 2009).

56. On the specific case of animal welfare, social science has explored farmers' behaviour as an expression of their practical, conceptual, ethical and sometimes even ideological

relationships with animals (Dockès and Kling-Eveillard 2006), and with the concept of animal welfare *per se* (Lund et.al 2004, Veissier et.al 2008). This has led to research on farmers' understandings of the concept of animal welfare in itself, particularly in relation to different farming systems (Alrøe et.al 2001; Hansson and Lagerkvist 2012; Segerdhal 2007; Vaarst and Alrøe 2012; Vetouli et.al 2012); and in comparison with other stakeholders (Tuyttens et.al. 2010; Vanhonacker et.al 2007; 2010; 2012). Furthermore, rural social science has also examined farmers' practical relationship with the social problem of animal welfare as mediated by both science and society (References List 5), and by cultural ideas about human-animal difference (Buller and Morris 2003; Tovey 2003). Evidently, there is a history to this relation (Broom 2011; Chaney 2013; Woods 2011), as well as a geography (Buller and Cesar 2007; Croney and Millman 2007; Mayfield et.al 2007; Spriggs et.al 2000). More recently, social science has made the argument that to the extent that animal welfare and farmers' engagement with it is a matter of science and society as well as human-animal relationships, these mediations must in turn be reflected in the on-farm assessment of animal welfare (Botreau et.al 2009; Main et.al 2007; Miele 2001; Miele et al 2011; Mullan et.al. 2010; Sørensen and Fraser 2010) and in the institutional framework designed to improve it (Berg and Hammarström 2006; Carporale 2005).

57. Defra has been careful to integrate some of these other variables into its understanding of what shapes and affects behaviour, as is evident in Figure 1 below. However, as critical social scientists convoked to identify areas where further research would be pertinent in order to make the evidence base more robust for policy decisions and interventions, we must note at least three concerns in this regard.

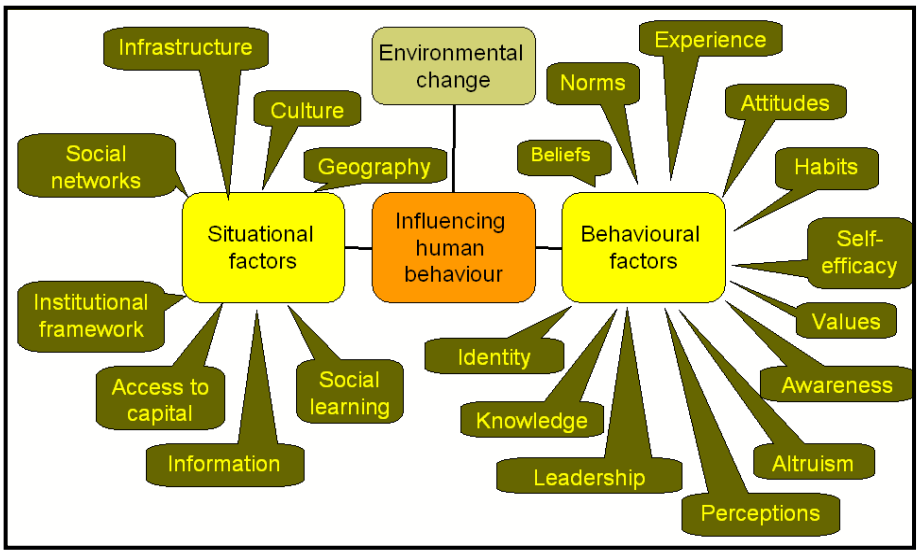

Figure 1: Factors contributing to Human Behaviour (Defra 2008)

58. First, these other variables should not be taken simply as additional layers that add complexity to the map that makes human behaviour understandable and thereby predictable and open to influence. Rather, it is crucial to understand that they have emerged from other approaches that frame behaviour in a different way, not as a function of attitudes, values and knowledge, but as the substance of wider social

interactions that become –in contrast to the individual- the focus of research and intervention.

59. This first concern is thus inextricable from a second one: how issues are framed determines too how they are addressed; an emphasis on framing issues at the individual level implies an emphasis on aiming interventions at the same level. This Fellowship has strived to show how the available social science literature indicates that farmer behaviour with regard to animal welfare is not so much an outcome of pre-determinable variables such as individuals' attitudes and knowledge but a matter of the wider interactions in which farmers operate. We argue that it is these interactions that should, on one hand, be at the core of a research agenda as well as become the focus of policy intervention, on the other, so that they could be addressed and managed in order to change behaviours. For example, there is considerable potential in addressing the matter of farm assurance schemes not in terms of seeking to influence farmers' values, attitudes, and behaviours but rather in terms of understanding - and dealing with - the broader issues that for some farmers make some schemes, as a whole, as well as their specific animal welfare components, less palpable and less relevant to their experience and their aspirations as members of the collective known as 'farmers'. In other words, shifting the focus from the individual to social relations opens up the possibility of understanding drivers and barriers as located in the social realm rather than in the individual's perception of it.
60. Such a shift in terms of how problems are framed, and thereby in the rationale that illuminates policy interventions, also implies a broadening of methodologies. Indeed, the approach centred on locating issues in the individual implies an emphasis on understanding their values, attitudes and beliefs and this has underpinned the prominence of surveys which albeit extremely useful tools in some instances, are not that helpful in trying to understand complex social relationships. Underlying the research gaps that we will raise in this document is the conviction that in order to understand farmer behaviour and decision-making there is much to be gained from using different methodologies that illuminate not so much an individual's perception of the world as determinant of their actions, but more the wider set of social relations in which their practices are constituted and performed, and this goal would be better served by other social science methodologies, including participant observation, ethnography, in-depth interviews, biographical, narrative, event and practice based approaches and visual methodologies.
61. In sum, on drawing upon this short review of rural social science and our interpretation of how its appropriation has impacted on policy options and evidence needs, this work has strived to contribute to an understanding of the potential for reframing the research approach to the issue of farmer behaviour by widening Defra's social science evidence base so that it incorporates approaches to understanding actions and decisions other than those based on attitudes, values and knowledge.
62. While this suggestion emerged first from the initial review of Defra in-house and procured evidence as set within the wider field of rural social science, the literature reviews on specific farmers behaviours with regard to animal welfare pointed in the same direction, as the evidence suggests that rather than outcomes of individual attitudes, values and knowledge, these specific on-farm practices are shaped by the various relationships of advice, audit and community within which farmers operate.

VI. HAVING A FARM HEALTH PLAN

EVIDENCE REVIEW

63. **Welfare as a component of FHPs.** Despite being formally presented in the Animal Health and Welfare Strategy of 2004 as a tool to improve the "health and welfare" of animals, the practical understanding of FHPs was pivoted around disease management and control: for Defra, FHPs involved identifying and managing disease risks, recognising them as early as possible, and controlling and preventing their presence and the risk of spreading them on (Defra 2004, p. 22). Welfare was not specifically incorporated. However, the argument that welfare ought to be a more salient component of plans has been made insistently. FAWC stated in 2005 that "a sound herd health and welfare plan and its implementation is essential to guarantee an acceptable welfare" and in his 2009 review of pump-priming expenditure in farm health plans, Osmond too highlighted that a farm plan "is a proactive way to help prevent disease and improve livestock performance by making animal keepers work closely with vets or other advisers to set targets for health and welfare and to measure, manage and monitor productivity" (p.10). Baker (2006) has unpicked this relationship between health and welfare in the context of FHPs and explained that "whilst health is an important component of welfare it is not the only component and healthy animals can exhibit poor welfare. Herd Health Plans should really be Herd Health and Welfare Plans and their objectives should be to raise standards" through encouraging good husbandry. However, the salience of welfare varies across plans and there is reason to expect that this affects the effectiveness of plans in terms of addressing and improving welfare.

64. **Contrasting roles of FHPs.** FHPs are not disconnected from the context in which they are promoted or required. While their role from an institutional/governmental perspective might be perceived as related to disease-control, within a commercial context they might be seen as a function of quality assurance – of course, disease control and quality assurance are inextricable but the emphasis is not insignificant to what farm health planning means for the day-to-day activities of a farmer.

65. **RESEARCH GAP: Therefore, the extent to which FHPs incorporate animal welfare and are perceived by the various actors involved (farmers, vets, industry, government and assurance schemes) as being BOTH about health and welfare, as well as the impact of such perception on farmer engagement with FHPs as a tool to improve animal welfare needs to be ascertained. This would provide evidence on which to make a policy decision about raising (and perhaps standardising) the profile of welfare within FHPs. The implication is that to raise the profile of welfare within FHPs and to make FHPs more effective as a tool to improve welfare there needs to be a consensus and a collective effort from all the stakeholders involved.**

66. **FHPs are also about generating cultural change.** Indeed, FHPs have also been seen as "an approach which is embedded in the everyday running of the business [...and their promotion aims] for a longer culture change whereby FHP became a routine feature of livestock management – embedded and self-sustaining, without government intervention" (Osmond 2009, p. 2). **However, their uptake is declining**. While the 2007

ADAS study reported that 85% of their farmers sample had a FHP, the Farming Practices Surveys of 2009 and 2011 reported 78% and 71% respectively. This decline in the uptake of FHPs would indicate that their potential to instigate cultural change has not yet materialised.

67. **Having a plan and using it: two different practices.** The evidence suggests that one reason behind their decline and them not fulfilling their potential to generate cultural change, is that plans have become a "tick box exercise" (Spencer 2008, p.168); and again, this is not disconnected from the context in which they are promoted or required. Evidence from other SME sectors suggests that compliance with audit and inspection regimes is complex and that barriers and motivators are less related to individuals' characteristics and more to the audit-inspection process, to ideas about responsibility and to contrasting understandings of what it means to comply (Fairman and Yapp 2005, Yapp and Fairman 2006). While for the auditor compliance may mean a pro-active and permanent process of adjusting practices and behaviours in order to meet standards and requirements, for the SME compliance might be merely "the outcome of the regulatory encounter" (ibid, p.68). In other words, compliance occurs only at the moment of inspection. In this sense, the distinction made by the National Sheep Association in 2006 between having a plan and planning is a useful one: the behaviour that makes an important difference is the active use of a FHP in day-to-day and long term management decisions.

68. Indeed, having a plan and using it as the basis for active planning are two different practices (Statham 2012). Evidence commissioned by Defra (ADAS 2007, p. i) points out the discordance between having a FHP and actively planning decisions without a formal written document. While not all farmers with a plan were actively using it to make their decisions, not all of those who were planning decisions had a plan in place. This discordance was also found in the cattle industry through a project run by the Milk Development Council: only 29% of farmers used FHP actively with their vets for proactive management; 20% used it for "some basic disease recording and action" (p.16) and more than half used it "for quality assurance purposes only" (ibid). Spencer too found that for many, FHPs are "just a paper filling exercise … a passive recording of what has gone before rather than active planning for what should come" (2008, p. 169).

69. **RESEARCH GAP: Farmers' understanding of what having a FHP entails in terms of their day-to-day practices requires investigation in order to understand if and how FHPs have become a tick-box exercise and the audit and inspection dynamics that contribute to this process. Further research would need to determine the links between FHPs becoming a tick-box exercise and the decline in uptake.**

70. What this evidence also shows is that there are farmers who make their decisions on the basis of planning practices that they already carry out, even if they do not have a written plan. What the NSA found is that farmers felt that although not within a specific FHP, they were already carrying out the management practices that they would need to write down in a FHP; and that this feeling underpins their perception that a FHP is just paperwork. In other words, while the specific formal and printed out plan is often perceived as a paperwork or tick-box exercise, the practices that a plan entails are sometimes already part of farmers' lives. The implications are threefold. First, that there is an issue with *writing* a FHP. Second, that the motivators for those who actively

plan and do not have a written document must be different to "ticking a box". While Huxley et.al (2003) and Bell (2006) found that most farmers do not perceive FHPs as beneficial to them (as opposed to being beneficial to others, such as consumers or retailers) there are still some farmers who perceive clearer individual benefits. These benefits need to be unpicked. And third, that what is meant by "actively planning" could also require a consensus.

71. **RESEARCH GAP: The drivers for actively planning even though there is no requirement for a written document, as well as farmers' own understanding of what "actively planning" entails in their day-to-day practices and decision-making require investigation. On the one hand, this would provide key evidence about farmers' understanding of the value of and the practices involved in farm health *planning*, and could therefore substantiate innovative and complementary policy interventions. On the other hand, it could provide the basis on which to audit and inspect *planning* rather *having a plan*.**

72. There is value, however, in developing and following a plan where record-keeping and record-analysing are pivotal practices. Having a written plan makes the benefits more visible. In 2007, ADAS found that beef, sheep and pig farms with recorded performance were more likely to report improvements. Although the link between having a FHP and improvements to health and profitability is not straight forward, record keeping was found helpful by 88% of the farmers (ADAS 2007). Baker (2006), Bell et.al (2006) and Huxley et.al (2003) have all underlined the importance of recording but not as an end in itself. The importance of record keeping is that analysing and reviewing records is the key activity to track progress and make benefits more apparent. In other words, the key is that while planning as a process rather than having a written FHP is the desired practice, having a document, keeping records and using them to make decisions and track progress should be part of that process.

73. **Sector and structural differentiation.** Research shows that uptake varies considerably across the different sectors. FHPs are widespread in dairy farms but are present in less than 50% of beef farms. They are distributed as follows: Dairy 83%, Sheep 56%, Poultry 56%, Pig 50%, and Beef 42% (ADAS 2007). Performance recording also varies: Dairy 76%, Sheep 44%, Poultry 71%, Pig 57% and Beef 47%

74. Research also shows (see Table A) that uptake varies according to farm size, with large farms being more likely to have FHPs than small farms (FPS 2011). Uptake amongst hobby keepers was at 15% for a written/recorded plan and 29% for thinking about having a plan. Further disaggregation per sector found hobby farmers' uptake of sheep 27%, dairy 25%, 18% pig, 13% beef and 4% poultry. The Milk Development Council project found clear evidence that farmers' attitudes to FHPs are distinctly linked to herd size: the larger the farm the more likely it is that they will have a FHP. However, a greater percentage of medium size farms have a written plan.

Table A. Farm Health Plans uptake by farm size

	Farms do not have a FHP	Farms have an unrecorded FHP	Farms have a written FHP
Small	41%	17%	43%
Medium	18%	15%	67%

Large	13%	10%	15%

Source: FPS 2011

75. **RESEARCH GAP: These differences indicate that barriers and motivators to uptake may also vary across sectors and farm size. Understanding these nuances would provide robust evidence for policy decisions about which sector or what farm size to prioritise for intervention, or how best to tailor interventions according to these factors.**

76. **The role of vets.** Evidence suggests that the vet is the main vector of support and encouragement in FHP uptake. While 60% of farmers used a vet/adviser to complete their plans in 2009, the percentage increased to 65% in 2011 (FPS 2011, p. 26). 55% of small farms had vet support for their FHP, compared with 64% medium farms and 77% large farms. When the farmer-vet relationship was closer, having a FHP was more likely (ADAS 2007, p. i). However, 54% of farmers reported using their vet only for emergencies; this percentage was 74% for hobby keepers. Further research would need to establish the impact of this "fire-brigade" relationship between farmer and vet on the documentation of FHPs becoming an end in itself –for which the vet might be called- rather than the partnership that is meant to be the backbone of farm health *planning*. ADAS also notes that a lack of clarity about how a FHP fits in with their current relationship with their vet sometimes prevents take-up. In other words, while vet support is crucial for uptake, it is not straightforward: what seems to matter is what kind of relationship there is between farmer and veterinarian. The current evidence is about having a written plan and it might be the case that farmers are keen to have the vet's support for writing the document. In other words, what merits investigation is the role of the vet in terms of *using* the plan.

77. **RESEARCH GAP: The farmer-vet dynamic with regards to FHPs needs to be better understood. One thing is that the vet is sought to advise on the drawing up of the document and another that the farmer and vet have a close relationship that underpins using the plan to inform farm management decisions.**

78. Recent research comparing farmers' and vets' attitudes to FHPs within the cattle sector indicates that both parts have contrasting ideas about their relationship. While farmers and vets coincide significantly on what the vet's role should be: aiding disease control, supporting animal health and welfare and treating individual animals (Hall and Wapenaar 2012, p.442), despite the majority of veterinarians (66%) wanting to fulfil a more holistic role as a "personal friend of the farmer style", able to identify problems in the farm and contribute to their solution, farmers are much more protective of their management role and only 30% of the farmers welcome this vet approach.

79. What this seems to indicate is that autonomy over the management of their farm is a key element of what we would call the farmers' emotional capital[3]. Osmond's finding that farmers would prefer FHPs to "avoid duplication and *need not be targeted at staff management practices*" (2009, p. 16, our emphasis) seems to reiterate this interpretation and is also evocative of other findings that Defra is already aware of, for

[3] This term has no academic credence and this document is far from being able to conceptualise it. We use it, however, to refer to the significance that safeguarding these emotional elements seems to have on farmers' actions and decisions.

example that farmers are more likely to implement measures that have been suggested rather than demanded (University of Cardiff 2008), and less likely to accept measures that they perceive as merely increasing bureaucracy and mining away their autonomy (SAC/University of Reading 2003). There is therefore reason to expect that initiatives that circumscribe themselves to addressing the language with which FHPs are presented so that they sound less imposing and more optional will still have limited effects if vets, records and FHPs are perceived to be trespassing and interfering with practices that farmers view as of their private domain (see also AEA 2010). The finding that having a vet and another adviser involved increased the chances of farmers perceiving their FHP to make a positive difference to their management could reflect a more open management outlook in the farmer; however, only 5% of farmers who had a FHP in 2007 reported having had support from both a vet and another adviser.

80. **RESEARCH GAP: More needs to be known about farmers' sense of autonomy and independence. In their running of their farms, farmers are supported by a complex network of advisors and inspectors. In addition, a wider network of stakeholders and food chain actors also affects the private space of the farm and the private nature of "farm management". How farmers relate to these networks and negotiate their own sense of autonomy within them cannot be disconnected from how they relate to the instruments, such as FHPs, through which these networks extend their influence on the farm and its management.**

81. Osmond (2009, p.39) highlighted in his Expenditure Review that while there is evidence that the veterinary is the key source of knowledge and support for farmers developing FHPs, in the same way as there is awareness that veterinaries have polarised ideas about the benefits of FHPs, "little is known about vet's attitudes, practices and competences in preparing farm health plans and promoting the approach to their clients". His report includes a list of what a survey should learn about vet's attitudes towards FHPs: attitudes to FHPs, opinions about their benefits (for farmers and themselves), attitudes to their role in promotion of FHPs, attitudes and opinions about uptake of FHPs, their competence to prepare, their skills to facilitate promotion activities and their training needs. Hall and Wapenaar's (2012) research is an important step in that direction. While vets are keen to reinvent their role in the farm and offer more management support, and both farmers and vets coincide in ranking improvements to animal health and welfare as the main advantage of FHPs, a greater percentage of vets (27%) regard FHPs as a "useless document", compared to only 16% of farmers who have the same view. However, what seems to emerge from this review is a complex clash of perceptions between farmers and vets not only about the roles of vets and FHPs, but also about how both perceive each other's knowledge and motivations. For example, with respect to FHPs, while 40% of vets perceived an economic advantage in FHPs, only 27% of farmers had the same view. Another contrasting opinion is about FHPs representing more regular and focused veterinary advice: vets seem to agree more with this perception (23%) than farmers (10%).

82. **RESEARCH GAP: These findings reiterate the relevance of exploring the dynamics and complexities of the farmer-vet relationship, as well as vets' own perceptions and practices in the context of FHPs. There is reason to expect that if the vet conceives of FHPs as a tick-box exercise this will affect the farmer's own engagement with farm health planning.**

83. **The role of industry.** Industry has been a key driver of FHPs, particularly through the various assurance schemes. However, the RSPCA has reported a fall in participation in all sectors, except pig and salmon, where membership has increased (RSPCA 2011). Moreover, while industries may understand the existence of an FHP document as evidence of the process of planning, the lack of industry standards, the absence of a system of quality control, the absence of a mechanism that makes evident the benefits of recording and reviewing records and the absence of auditing and assessment processes have been identified as weaknesses in the schemes' approach (Pocock 2004). Albeit in the field of compliance with tax regulations, Slemrod's (2007) finding that individuals' behaviour is affected by regulatory behaviour is worth mentioning: if industry demands FHP documents, or the relevant box ticked, but is lax in monitoring quality control and facilitating progress review, it is likely that farmers will have a similar understanding of FHPs. When part of an industry assurance scheme, the requirement needs to be set with more rigorous standards and include record keeping and active planning.

TOWARDS A RE-FRAMING OF FHPs

84. Interventions could focus on re-contextualising the value of FHP as a ***process***; and its outcome, in the shape of a document, as a tool to achieve health ***and*** welfare improvements. Given that the research shows that farmers are already implementing several of the practices that would be included in a FHP, there would be value in tailor-made interventions, sensitive to differences in sector and structure that allowed farmers to develop their own guides to what a FHP implies and offers in practical terms.
85. Industry support would be crucial, as assurance schemes are an important driver. However, industry's understanding of FHPs as a document, which needs ascertaining, may also have affected FHPs potential to deliver changes in practices and culture. Industries would need to raise standards and develop quality control systems and better auditing and assessment mechanisms that focused on ensuring active planning rather than having a written plan.
86. While there is evidence about what farmers decide not to do, there is much less about the practices that farmers carry out voluntarily, based on their own expertise, to improve the welfare of their animals. There is also evidence that sometimes farmers tend to discard top-down changes they come from sources that they feel do not understand or know what farming is (University of Reading 2003). A combination of ethnographies and/or in-depth interviews to identify those voluntary practices, and participatory workshops to tap on them, a collective dialogue including policy, farmers and auditors could build the backbone of bottom-up FHPs that reflected and built on these voluntary practices.
87. This dialogue approach could also facilitate shifting the issue from the production of a document to the optimisation or transformation of practices. Indeed, after conducting several trials and interviews in five European countries including the UK, Vaarst et.al (2011) found that a permanent process of dialogue between a farmer and an advisor or amongst a group of farmers is the key to FHP ownership by farmers. Tyran and Feld's (2006) finding that individuals respond better to endogenously developed standards than to exogenous and imposed regulations would seem to support the rationale for the

dialogue approach. The approach is also endorsed by Falconer (2000, p. 393), who argues that "too often farmers are seen merely as passive recipients and not active participants in both policy analysis and the literature of technology transfer". In these dialogues, advisors play a facilitator role rather than an "external expert" one and his/her expertise should be requested rather than imposed as a requirement. This implies recognition of the knowledge and autonomy of farmers in the management of their farms. Hall and Wapenaar's (2012) finding that 82% of farmers consider themselves knowledgeable enough to make management decisions, while only 32% of vets consider their clients able to make informed management choices, suggests reasons why farmers are unlikely to allow someone else into their management practices. It follows that building FHPs on farmers' practices could shed new light on farmers' practical knowledge while encouraging participation, ownership, community and a sense of professionalism.

88. There is also reason to expect that an intervention that builds on what farmers already do would to some extent alleviate the main disadvantage that both farmers (59%) and vets (51%) find in implementing FHPs: time (Hall and Wapenaar 2012). The dialogue approach developed by Vaarst et.al (2011) includes the possibility of records being taken by someone else and not the farmer, but insists that the analytical dialogue about the records takes place at the same time as recording. In other words, rather than expecting the farmer to take records that are to be analysed and reviewed once a year with the vet, the dialogue approach imagines record-taking and analysing as one recurrent process between farmer and advisor. This should make the benefits of record-taking and planning clearer, incorporating the practice as a valued activity rather than as a waste of time: "the dialogue regarding the data and its role in health planning needs to be a part of the ongoing planning process and not just when formulating the health plan" (Vaarst, et.al 2011, p. 64).
89. FHPs are potentially good tools to improve welfare, but they are also potentially good interventions to achieve other goals, like improved farmer-vet relations, get cultural change dynamics going, increase ownership of responsibility, contribute to professional pride and ameliorate farmer-government relations. Falconer (2000, p.391 and 393), has claimed for example that "participatory approaches to policy generally strengthen local capacities for action and progress to improve the quality of living" and that "such partnerships … could evolve into important components of rural identity".
90. An evidence-based political decision would need to establish whether interventions could be prioritised according to:
    - Sector: As Osmond (2009, p. 20) asks, "Have some sectors already got their house sufficiently in order even without 90% FHP uptake?" and "is it equally important to obtain high levels of coverage in all sectors" (ibid. See also Robert 2012)
    - Farm size: Given the differences in uptake by size, what would be a priority: to achieve high uptake per proportion of animals or per proportion of farms?

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SUMMARY

This review indicates that farmers' decision to have and actively use a FHP takes shape through the various relationships in which they operate. Their relationship with their vet is both a driver and a barrier. Although a close farmer-vet relationship increases the likelihood of farmers having and using an FHP, farmers seem reluctant to see veterinarians getting involved in farm management decisions. In addition, while assurance schemes have driven the uptake of FHPs, there is indication that audit regimes associated with such schemes could contribute to FHPs being perceived as mere paperwork while placing less emphasis on the active use of FHPs for making management decisions. For FHPs to more strongly drive the desired practice of planning, the evidence suggests that a collective consensus would be required. These interpretations of the literature, however, need much further investigation. We suggest exploring a shift in the framing of the issue of farm health plans from encouraging farmers to have a FHP to developing a collective (all stakeholders) understanding of FHPs as a process – rather than a document - that farmers perceive as integral to their professional pride and identity.

EVIDENCE

- Having a written plan and using it to inform decision-making are two different practices. Not all farmers who have a plan make active use of it and not all farmers who collect data and use it to inform their decisions do so on the basis of a requirement from assurance schemes or other bodies
- Uptake and usage of FHPs varies across sectors and farm size
- Farmers frequently seek the support of vets in drawing up a plan, but are less comfortable with vet's efforts to encourage the active use of FHPs. There are indications in the literature that FHPs might be perceived as an intrusion (by vet and/or government) in farmers' sense of knowledgeable autonomy and management independence
- The links between FHPs and improved productivity, health or welfare are not always apparent to farmers and thus these outcomes don't always act as drivers for farmers to keep and use a FHP
- There is some evidence that the main driver for developing FHPs is compliance with assurance schemes. However, to an extent that needs to be determined, FHPs may have become a 'tick-box exercise', affecting farmers' engagement with the idea of keeping and using FHPs as a useful farming practice
- Although it requires further research, the literature also indicates that record-keeping seems to be seen as an end for compliance purposes rather than as a means for analysis, decision-making and progress review, or as benefitting someone else while costing/wasting time, rather than as a means for analysis, decision-making and progress review.

RESEARCH GAPS

- Further investigation is required first on the manner in which the differing intentions of FHPs impact on the perception of them as merely 'tick-box exercises' and second, on the impact of variable FHP requirements on specific animal welfare aspects

- In-depth qualitative evidence is required to understand why some farmers voluntarily collect and use data (and which) to improve welfare, without external requirements. Record-keeping and record-using practices need to be better understood
- Our interpretation that farmers might perceive FHPs and those who encourage their active use as conflicting with their sense of autonomy and management independence warrants further investigation
- The differences in uptake and usage of FHPs across sectors and farm size need to be better understood
- The farmer – vet relationship as pivotal for uptake and active use of FHPs. The intricacies and complexities of this relation in general and with regards to FHPs in particular require further research
- That FHPs may have become a "tick box exercise" is indicative of farmers understanding compliance as "at the moment of inspection", rather than as an active and permanent process of farm management. It is important to understand how the disparities in welfare standards, quality control systems and auditing and assessment mechanisms across different industry FHP requirements have contributed to reinforce this view of FHPs amongst both farmers and industry. It is crucial to understand these audit and inspection dynamics and how all the stakeholders involved participate in shaping this view about FHPs
- Experiences when farmers have developed and applied their own understanding of what a FHP should incorporate need to be investigated.

VII. PARTICIPATING IN FARM ASSURANCE SCHEMES

EVIDENCE REVIEW

91. Participation in assurance and certification schemes is related to a number of different factors. Although there has been relatively little research into why farmers join or do not join voluntary certification and assurance schemes, insights can be drawn from previous studies of farmer behaviour and farmer participation in voluntary schemes and actions.
92. Earlier studies (see for example Beedell and Rehman 1996; Brotherton 1989 and 1991; Wilson 1996; 1997a and b) examined the influence of different factors, particularly those traditionally associated with socio-economic theories of behaviour such as Azjen and Fishbein's (1980) Theory of Reasoned Action. However, the following review of the more recent literature suggests that the uptake and to some extent the effectiveness of assurance schemes is underpinned by a complex and historical set of power relationships, contrasting expectations and divergent values that call for a wider social science research approach.
93. **Contrasting expectations: Farmers.** For some sectors, notably pig production (FAWC 2005), participation in some form of industry-led assurance scheme is regarded as almost compulsory as it constitutes a *de facto* requirement to market access (Miele et.al 2005, see also Bock and van Huik 2007; Hubbard et.al 2007; Hubbard 2012). Farmers' expectations when joining a scheme are either about accessing the market or about obtaining better prices for their produce, though there are important differences by sector that we will note later on.
94. These expectations are in turn related to the type of scheme. The more conventional or standard schemes such as those under the Red Tractor logo might be joined because "my arm was twisted" (Hubbard et.al 2007, p. 923) or because "there is no option" (FAWC 2005, p. 58). Although better prices were a motivator for those who join organic schemes, this was not revealed to be a universal driver for participation: none of the Freedom Food or Soil Association farmers interviewed by Hubbard et.al (2007, p. 923) identified "price premiums for their products as a motivation of membership".
95. Differences in uptake between schemes are also related to farmers' own understanding and valuation of the importance of animal welfare. Although they suggest that both conventional and Freedom Food farmers join schemes primarily to ensure they remain in business, Hubbard et.al (2007, p. 923) note a difference in that "the majority of Freedom Food Farmers stated that the animal welfare implications of their scheme were also important to them". Similarly, Bock and van Huik (2007), whose research focused on pig farms, demonstrated how farmer preconceptions in the definition of welfare – some defining welfare as health and good condition, others seeing it as natural behaviour – were key factors in decisions whether or not to join a voluntary certification or assurance scheme.
96. Such findings are not inconsistent with those of Kilbride et.al. (2012) concerning the relationship between farm assurance membership and degree of compliance with animal welfare regulation. Kilbride et al's research showed that the percentage of non-compliance inspection in non-assured farms was 31%, whereas in assured farms it was lower at 19%, with organic farms at an even lower level at 13%. This is an important

finding for it implies a potential linkage between voluntary and formal regulatory strategies, one we shall return to below.

97. In short, the existing research suggests a degree of polarisation in farmer participation in schemes, between, on the one hand, what are essentially issues of economic survival where meeting voluntary welfare standards becomes a requirement to market access and, on the other hand, a broader commitment to ensuring and improving the welfare of animals. Moreover, it might be suggested that the market has responded to this (or indeed has directly engendered it) by providing a range of assurance certification schemes going from those like the Organic or Freedom Food schemes that respond more closely to farmer engagement with these issues, to industry-led schemes such as Red Tractor that act as gatekeepers to retailer shelves. In reality, the drivers and barriers are, we would argue, more complex than this.

98. **RESEARCH GAP: These differentiations by scheme and sector need closer examination, and the connection between drivers, membership, compliance and commitment to animal welfare needs to be better understood.**

99. **Contrasting expectations: retailers, public policy and the consumer.** From the retailers' point of view, assurance schemes have been principally about demonstrating due diligence (Appleby 2009, Duffy and Fearne 2009; Main et.al 2001), protecting brand image and tightening customer trust and loyalty (FAWC 2005; Morris and Young 2000). More recently, however, as animal welfare has effectively entered the market place as a commodity that has value (Buller 2012; Buller & Roe 2013), schemes have also become a vector in competitive advantage and brand development. This is currently having a number of important effects. First, it is leading to a far greater level of commercial secrecy with respect to what aspects of farm animal welfare are being addressed in the certification and assurance schemes of individual retailers and food processors. Second, it is leading to greater competition between retailers and other actors to introduce ever higher standards. While it might be argued that this has the advantage of raising standards, it is debateable to what extent the 'right' standards are being addressed in this competitive process (Roe & Buller 2011). Moreover, it places farmers and producers in the difficult position of having to constantly respond to shifting regulatory requirements. Finally, as FAWC has repeatedly insisted (2001, 2005, 2013), there is an increasing need for greater transparency in retailer schemes so that the schemes properly deliver their potential to ensure the application of animal welfare conditions (FAWC 2001, p. 4) and communicate the value of animal welfare to consumers (FAWC 2005, p. 3).

100. Assurance and certification schemes have different roles for different stakeholders: they are about due diligence, customer loyalty and brand marketing for retailers -and Sainsbury's latest decision to abandon the Red Tractor logo in its labels is a good example- (BBC Radio4, *Farming Today* 18/10/12 Transcript). They are about minimum standards within the industry itself. They are about access to the market for most producers and about better prices for only a few (largely organic) farmers. At the same time, public policy sees them as a "way of communicating value to consumers" (Policy Commission on the Future of Farming and Food 2002) and "increasing public concern for animal welfare" (Appleby 2009, p. 108). Amidst these multiple functions, the potential of assurance schemes to deliver improvements to animal welfare, endorse and enhance consumer preference for welfare-friendly farming practices and improve

relationships across the whole of the food chain is not always evident, while at the same time, as the literature clearly demonstrates, consumers feel confused and have little knowledge of what schemes are about (Duffy and Fearne 2009; FAWC, 2011).

101. **RESEARCH GAP: More needs to be known about how these different expectations, particularly amongst retailers, have an effect on the different stakeholders' commitment to welfare.**

102. **Relationships of power**. While retailers present (and profit from) assurance schemes as a means not only to demonstrate compliance with safety and quality standards to their consumers but also as a means of segmenting the market through the deployment of differential welfare standards, farmers largely fail to perceive the potential benefits of such schemes (Duffy and Fearne 2009; Fearne and Walters 2004). Such contrasting expectations and understandings of farm assurance schemes by retailers and farmers is a potential barrier to the greater use of such schemes in the regulation and improvement of farm animal welfare, particularly when, as Duffy and Fearne (2009) suggest, many farmers see themselves as bearing the costs of the consumer and retailer demand for higher welfare standards without the subsequent benefits. For example, FAWC (2011, p. 19) has expressed concern about "some retailers now beginning to use [the RSPCA's Freedom Food] as the basic requirement for purchase, without significant additional premium, onto which other points of differentiation are superimposed in branded products" The reaction of the Chief Executive of the Red Tractor Scheme to Sainsbury's recent decision to drop the logo from its own packaging is a good example of the tension generated by this lack of perception of benefits as a consequence of the imbalance of power between farmers and retailers. His argument was that the retailer's strategy was to:

"position themselves especially in the intensive livestock sectors, so pigs and poultry sector, on an animal welfare platform which is slightly above where we are in Red Tractor [on the basis of a platform of standards provided by the industry, that] farmers feel proud of [but for which] we're not going to get any recognition (BBC Radio4, *Farming Today* 18/10/12 Transcript).

The Director of Sainsbury's own brand products recent statement is also revealing. She claims that consumers:

"have a very simple interpretation of [the Red Tractor logo] that it's about supporting British farmers, they certainly don't see it as a standard and I think we have to be very … clear about the difference between a logo on pack and the standard because the standard we are not moving away from".

As Hubbard et al (2007:927) have stated:

"UK farmers can reasonably be described as the 'pig in the middle' when it comes to the delivery of farm animal welfare standards. To one side are the regulators and assurance schemes, imposing a range of regulations and standards which farmers must adhere to if they are to remain in production. On the other side are the retailers and consumers,

many of whom are perceived by farmers as paying only lip service to the goal of improved animal welfare and as being driven by the desire to achieve higher profits or lower prices. Farmers are therefore faced with an increasing burden of inspection and changed practices in order to comply with these enhanced standards, but are in turn offered little in the way of market or price enhancement as a reward for their efforts".

103. In other words, the multiple benefits of joining an assurance scheme that could motivate a farmer, such as lowering monitoring costs (through cost-savings), obtaining better prices, improving animal welfare, improving relationships with buyers and facilitating access to new markets, are not apparent or insufficient (FAWC 2011, p.20). Instead, at least for some farmers, schemes are a barrier and hindrance to productivity (Bock and van Huik 2007; Veissier et.al 2008). The following table is illustrative of farmers' perception of the lack of benefits such schemes bring. In both sectors, 38% of the farmers reported not to have benefitted at all.

Table B. Benefits of farm assurance scheme membership as reported by pig and beef farmers

	% of ABP* respondents	% of ABM** respondents
Access to new markets	7	21
Increase in average price	2	23
Quality of animals has improved	2	2
Production costs have reduced	1	-
Farm management has improved	5	7
Able to demonstrate compliance	55	41
Have not benefited at all	38	38

Source: adapted from Duffy and Fearne (2009:675) * Assured British Pigs ** Assured British Meat

104. **RESEARCH GAP. It is vital to better understand these negative perceptions of schemes' benefits, how do they vary for the different schemes and sectors. Understanding positive perceptions and the ways in which benefits become more manifest is also crucial.**

105. Research also suggests (for example, Bock and van Huik 2007; Duffy and Fearne 2009, Hubbard et.al 2007, Hubbard 2012; Veissier 2008) that these mixed expectations and the distribution of costs and benefits of FAS membership lead farmers to distrust retailers, their use of assurance schemes and the legitimacy of their concern for welfare, given the incongruity that farmers perceive between consumers' voiced concerns for animal welfare and their actual purchasing decisions. Indeed, the farmers interviewed by Hubbard et.al (2007, p. 926-927) thought that the public is ill-informed about farming and mistaken in thinking that farmers can treat their animals as pets. Moreover, they regarded retailers' interest in animal welfare as superficial and opportunistic. Retailers, they argue, have used welfare predominantly as a marketing

tool and have gained an "influence that is too high". In the words of Duffy and Fearne (2009, p. 682), the "divergence in expectations and resultant tension in trading relationships is particularly ironic given the argument that the adoption of farm assurance schemes provides a mechanism for strengthening the competitive position of scheme members and improving relationships in the food chain".

106. **RESEARCH GAP It is vital to understand the complexity of these perceptions of distrust, how they affect farmers' commitment to welfare and their impact on the effectiveness of schemes, especially with regards to animal welfare as one of their components.**

107. These findings suggest, at least to the extent that further investigation is warranted, that under these circumstances assurance schemes may not reach their full potential to achieve improvements in animal welfare, not least because of the inherent confusion in the understanding of farm animal welfare as either a matter of market segmentation or a broader public good. If the former, the perception is then that the matter is in the hands of private stakeholders that need to clearly differentiate levels of welfare as a basis of price variability; if the latter, then the expectation is for public policy to intervene (Main 2009. See also Fraser 2006).

108. For Eden et.al (2008, p. 624), the concern is that: "rather than providing a solution to the problem of distrust, many food assurance schemes may themselves come to be distrusted". Mullan et.al (2011, p. 598) show how, for farmers, the situation "is in danger of demotivating the entire industry", while Hatanaka et.al (2005:356), have taken issue with this politics of certification and argued that schemes have been used strategically by supermarkets, not as impartial tools but having the power to "reorganize, transform and discipline people and things" (see also Hatanaka and Busch 2008). The uneven impact of what are becoming highly differential standards introduced through private assurance schemes has yet to be fully researched and remains a major research gap.

109. **RESEARCH GAP. The impact on farmers' commitment to animal welfare of contrasting views about the role of schemes, the distribution of costs and benefits to which they might lead and the consequences they might have on food chain relationships are only indicated but not fully explored in the literature, it is vital to explore them further.**

110. **Effectiveness.** It has been claimed that assurance schemes have had a limited and patchy effect on welfare standards as a whole (Main and Mullan 2012). Although it has been suggested that competitive standards applied by food retailers and other actors have driven up certain standards in certain contexts, these often remain scheme specific and there is little evidence to suggest that such market-driven standard raising is impacting on regulatory minima (though it might be suggested that the free range and caged egg sectors are an exception to this, where regulatory minima have been raised following consumer-driven retailer actions, see Buller and Roe, 2013).

111. Nevertheless, there is evidence to suggest that broader compliance with regulatory standards and procedures does tend to be higher in assured farms. For both the pig (Main and Green 2000) and the dairy (Main et.al 2003) sectors there is evidence of higher levels of compliance in assured farms with respect to non-assured farms. However, care needs to be taken in the interpretation of these results, which also need to be disaggregated as not all practices are judged sound or relevant by farmers (Bock and van Huik 2007; Hubbard et.al 2007; see also Mullan et.al 2011). For example,

Hubbard et.al (2007) found that action on issues such as stock density, tail docking and medicine restrictions depended on farmers' preconceptions of them as genuine welfare issues. Bock and van Huik (2007) also found this to be practice-dependent, with effectiveness being linked to contrasting concepts of animal welfare. While allowing pigs to live outdoors was seen negatively by farmers holding what they define as a zoo-technical understanding of animal welfare, those associating good welfare with a degree of "naturalness" found this activity pivotal for the animals' welfare.

112. **RESEARCH GAP. While compliance with and effectiveness off assurance schemes in terms of animal welfare may be explored generically, there is reason to suggest that research is also needed to understand how compliance and effectiveness varies for the diversity of animal welfare issues and practices covered by different schemes.**

113. **Emotional Capital as driver** In their examination of four different initiatives to steer improvements in animal welfare, Main and Mullan (2012) found that although there is evidence that financial incentives produce positive results - as in the case of organic farmers investigated by Bock and van Huik (2007) and Hubbard et.al (2007): "there is also evidence that farmers do not always follow advice based on sound financial information" (Main and Mullan 2012:107; see also Huijps et.al. 2010). Elsewhere, Valeeva et.al (2007) found that "internal non-monetary factors that involve internal esteem and taking pleasure in healthy animals on their farm are equally motivating as monetary factors". Likewise, Leach et.al (2010a and b), found that pride in a healthy herd and feelings of empathy (such as feeling sorry for a lame cow) were more important motivators than profit or assured status concerns. Subsequently, Main and Mullan (2012:108) speak of "animal-focused motivations".

114. **RESEARCH GAP. It is crucial to better understand the role of empathy, professional pride, and professional identity both in terms of commitment to animal welfare and of compliance with the ethos and standards of the various assurance schemes.**

115. **Sector** Recent figures by the RSPCA (2011) reveal important differences by sector in uptake of its Freedom Food scheme:

Table C. Freedom Food Market Penetration by Sector 2011/2012

Sector	**Market Penetration**	
	2011	2012
Salmon	58.67%	38.67%
Laying Hens	40.46%	35.59%
Duck	31.80%	16.29%
Pig	28.63%	29.49%
Turkey	7.31%	10.41%
Chicken	4.69%	3%
Dairy	0.50%	0.53%
Sheep	0.40%	0.35%
Beef	0.33%	0.39%

Source: RSPCA Reports 2011 and 2012

116. Although the overall number of animals under its scheme increased from 49 million in 2009 to 75 million in 2011, and even though the number of animals reared under the scheme grew by 84% in the pig sector, by 60% in the chicken sector and by 53% in the laying hens sector, year to year comparison of the scheme's market penetration figures would seem to indicate falls in scheme participation from 2011 to 2012 for some sectors (salmon, laying hens, duck, chicken and sheep) and increases in others (pig, turkey, dairy, beef). The RSPCA's Freedom Food is just one scheme but it is the only scheme that focuses principally on animal welfare. The reasons behind these fluctuations are beyond this report. The purpose of including these figures here is to illustrate that there are differences in uptake of schemes by sector that need to be further understood. The extent to which these fluctuations are related to animal welfare specifically also need to be examined.

117. Duffy and Fearne (2009) found that while more pig farmers in their study had joined a scheme to gain access to the market, more beef farmers had been motivated by the prospect of better prices. Beef farmers also reported having gained access to new markets, as Table B shows. However, as the RSPCA figures reveal, beef is the sector with the least market penetration. If beef farmers do find better prices, why does the RSPCA's Freedom Food scheme represent such a small proportion of the beef market?

118. **Farmers' concept of animal welfare** Bock and van Huik's (2007) relate the contrasting definitions of animal welfare held by different farmers (health and general condition being held by those farmers who participate in conventional schemes and "naturalness" being more common in organic scheme farmers) to farmers' definition of what being a good farmer implies (see also Burton 2004). While conventional scheme members work on the understanding that a good farmer is an efficient farmer who generates the largest amount of produce at the lowest possible cost, those who see animal welfare as a matter of rearing animals under the most natural possible conditions see good farming as caring and protecting the environment through their farming practices.

119. **RESEARCH GAP Differences across sectors for scheme uptake need to be better understood with their link to welfare as a specific component of schemes fleshed out in detail.**

120. **Costs** Not all farmers mention cost as a barrier to scheme membership (Hubbard et.al 2007). However, the associated costs more often complained about are about record-keeping and paperwork, which demands time and puts pressure on labour availability (Fearne and Walters 2004). However, these authors also found that although some of these costs would have had to be incurred anyway in order to comply with the law, "significant numbers of farmers associate compliance with food law on the farm with farm assurance standards and attribute those costs exclusively to farm assurance" (ibid, p. 3). They also found that some farmers incur costs because they do not have the right information about requirements: for example, they think they need a visit from the vet for sign up when this is not a requirement. As the authors note, communication about law and scheme requirements needs to be improved to avoid unnecessary costs and additional costs being put down to membership when they are not directly associated with them. Weighed against other barriers, Main and Mullan (2012) found that affordability of solutions [to animal welfare issues] is less important than lack of time and availability of labour.

121. **RESEARCH GAP. These apparent knowledge gaps with regard to the costs involved and their impact on uptake needs to be examined. The issue of "lack of time", ubiquitous as a barrier for many of the case studies needs to be explored. Mapping farmers' habits and routines and their prioritisation of activities would be illustrative.**

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SUMMARY

While FAS have emerged as important tools for the achievement and improvement of animal welfare standards, the evidence reviewed indicates that this potential is not always fulfilled. The evidence indicates that farmers' decision to participate in FASs is related to their expectations in terms of benefits such as access to markets and better prices. How these benefits as well the associated costs are distributed across the food chain is in turn related to stakeholders' contrasting expectations about the role and purposes of the schemes. How these contrasting expectations and benefit/cost distributions affect farmers' participation in FAS and specifically their commitment to animal welfare as a component in FAS needs to be investigated so that uptake of schemes effectively translates into tangible impacts in terms of ensuring/improving animal welfare. There are sector and scheme differences that ought to be fleshed out in research. Other drivers suggested by the literature, such as commitment to particular farming practices or a willingness to demonstrate professionalism also need to be investigated. We argue that research evidence is needed to underpin a broader food chain consensus on the role of schemes with respect to promoting welfare and nurturing farmers' sense of professional pride and individualised benefit.

EVIDENCE

- Farmers have different expectations about the benefits of participating in FASs and these vary by sector, scheme and farmers' ideas about and degree of engagement with animal welfare. These differing expectations include the validation of professional practice, ensuring access to the market, obtaining premium prices, fulfilling a commitment to animal welfare and demonstrating compliance.
- Views about the role and purpose of FASs also vary amongst other stakeholders. For retailers, FASs are about competitive segmentation, due diligence, customer loyalty and brand marketing; for industry, FASs are about meeting and in some cases exceeding minimum standards; and for the policy sector FASs are about developing market-driven standards and communicating welfare to consumers.
- Although **limited**, there is some evidence that some farmers see these variations in the perceived role and purpose of FASs as producing an imbalance of power that disfavours them in the distribution of accreditation costs (such as time, money, increased paperwork and stretched labour availability) and benefits.
- There is some evidence of feelings of disillusionment and distrust amongst some farmers with regards to the commitment of retailers and consumers to sharing the costs and benefits of ensuring and or improving animal welfare. The extent of these feelings and perceptions, as well as their effects on FAS uptake and farmer commitment to animal welfare needs to be established through further research.
- Complaints about inconsistent monitoring of schemes and perceived unfairness in inspection/certification process and their effect on uptake and commitment warrant examination.
- There are differences in the weight that different schemes give to specific welfare issues. Further research would allow an understanding of how this relates to farmers' own differentiated commitment to various specific welfare issues.

- While farmers' views about the financial benefits of FAS membership vary, the literature suggests that other benefits, such as demonstrating compliance and commitment to animal welfare are also (and sometimes more) important for farmers. Research needs to investigate these other drivers.

RESEARCH GAPS

- There are good indications that ideas about what being a 'good' farmer means have an effect on the uptake and effectiveness of assurance scheme membership. However, the evidence is limited and further research is required to examine what ideas circulate within farming cultures around FAS accreditation, disqualification or withdrawal; what kind of social norms are involved in assurance membership, how they influence uptake and how do these cultural ideas vary across sectors
- There is some evidence on the pig and beef sectors, but there is a need for research on other sectors and for cross-sector studies
- Research is needed to establish how FAS membership is different from other forms of regulation in terms of ensuring/improving animal welfare
- The disparities in the expectations that different stakeholders have from FASs –as implied by the literature - and their consequences on uptake of and commitment to FASs as well as on FASs' effectiveness in terms of ensuring/improving welfare warrant further investigation. This would need to recognise important differences across the multiple schemes
- The literature indicates that farmers perceive the processes whereby the practices and regulations that are included in schemes are set as very "top-down", and that they would prefer a more participatory approach. Research is required on how the rules of schemes are constructed and on alternative more participatory approaches
- The literature indicates that it is possible that the fact that the separation of inspection from advisory roles in FASs might have the effect of encouraging farmers to view FASs as bureaucratic rather than management activities. Further research is needed to understand the effects of the disconnection between inspection and advice
- The competitive standard setting common in retailer assurance schemes leads to changing rules and conditions for producers and this has been identified as a possible barrier to greater uptake, but more research needs to be done on this
- Drivers other than financial benefits need to be better understood.

VIII. PROVIDING PAIN RELIEF

EVIDENCE REVIEW

122. A farmer's decision to administer pain relief branches out into a complex tree of factors and considerations that has been under-researched from a social science perspective.

123. The following review details this complexity and points out the issues that seem more relevant, but the key message is that this area is substantially under-researched in at least three ways. First, most of the research is emerging from fields other than social science, mainly veterinary studies, and has concentrated on vet attitudes rather than on farmers'. Second, none of the factors mentioned below has been explored in depth and the role of cultural scripts, or how these factors vary according across sectors and farming systems has not been examined. Third, the literature has focused on the cattle sector, with a few papers on the pig or sheep sector, but the poultry section has been neglected.

124. **Procedure/ Condition dependent.** In first instance, it is important to make the obvious point that the decision to administer pain relief is not generic but varies by condition or procedure. For example, farmers would be more inclined to provide analgesics for claw amputation (97%) or caesarean sections (98.6%) than for debriding a DD lesion (38.1%) or treating a sole ulcer (49.5%) (Huxley and Whay 2007).

125. **Related to perceptions about pain – but only partly.** These variations are partly related to if and how painful the condition or procedure is perceived to be (Whay and Huxley 2008; Weary et.al. 2006). In their survey of veterinarians' use of analgesics, their decision to provide them for claw amputation and c-sections is linked to their scoring of these procedures as 10 and 9 respectively on a pain score where 10 is the worse imaginable pain (Whay and Huxley 2008). This link is also manifest in the fact that practitioners who do not provide pain relief tend to give lower pain scores (see Huxley and Whay 2006, p. 667). Although these scores were for veterinarians, Thomsen et al's (2012) comparison of farmer and veterinarian scoring would give reason to expect that farmers' scores would be similar to vets', and if any different they would tend to be higher. Indeed, Thomsen et.al (2012) found that "overall, farmers and veterinarians tended to agree in regard to which diseases were painful and which were not" (p.95) and "farmers considered most of the disease conditions to be slightly more painful than veterinarians" (p.94). Admittedly, the complaint could be made that Thomsen et.al were looking at diseases and at Danish farmers and veterinarians, while Huxley and Whay focused on procedures and on a UK scenario, but while these differences warrant further research, for the purposes of this review we will assume that in general farmers and veterinarians give similar scores for pain experienced due to diseases and procedures.

126. However, if the provision of pain relief derived directly from an estimation of pain there would be reason to expect the use of analgesics to be widespread at least for those procedures or conditions deemed to be more painful; more so given that according to Thomsen et.al (2012, p. 96) 93.8% of farmers and 98.5% of veterinarians concur that "cows benefit from the use of analgesics" and 84.3% and 97.8% of farmers and vets respectively agree that "cows recover faster after the use of analgesics". Yet,

25.1% of the vets surveyed by Huxley and Whay (2006) reported not using any form of pain relief (analgesia or anaesthesia) during surgical castration of calves despite giving a score of 6 points to the procedure. Disbudding of calves, with a score of 8 points, was carried out with some form of pain relief on "less than a quarter of occasions" by 54.5% of vets, on "between a quarter and a half of occasions" by 18.2% of vets and on "more than three quarters of occasions" by only 27.3% of practitioners. This apparent incongruity is also evident in the treatment of hock lesions for example. Although the majority of farmers surveyed by Potterton et.al (2011, p.173) acknowledged that both moderate and severe lesions "would have at least some impact on the production and the welfare of the animal", farmers were found to provide treatment only to a "small number of animals, on an infrequent basis and possibly for the most severely affected animals". In other words, acknowledgement of pain and recognition of its signs is not always a driver; the decision is far more complex.

127. **RESEARCH GAP. Given high levels of perception of certain procedures and conditions as very painful, and the generalised agreement on the benefits of providing pain relief, what explains the lack of consistency in providing that relief? Why and how do farmers and vets decide whether or not to provide pain relief? These decision trees need to be understood by condition or procedure.**

128. **The issue of cost** Several culturally embedded ideas have been identified as factors that may influence the decision to provide pain relief, including ideas about young animals experiencing less pain than adults, some degree of pain being necessary to prevent potential damaging movement and analgesics masking signs of a deteriorating condition (Misch et.al 2007; Thomsen et.al 2012; Whay and Huxley 2008). Nonetheless, the issue of cost is often mentioned as the critical factor (Hudson et.al 2008; Huxley and Whay 2006).

129. However, Table D collates data from two surveys carried out by J.Huxley and H. Whay (2006 and 2007) about vets' and farmers' attitudes to and usage of pain relief in the cattle sector. Their survey on farmers also included a question about whether and how much farmers were willing to pay for pain relief for different procedures. The surveys are indicative of a discrepancy between farmers' willingness to pay for pain relief and vets' perception of such willingness -which presumably leads to veterinarians' not offering a range of options (as has been found to be the case in Canada, Hewson et.al 2007). For example, while veterinarians were sceptical of the statement "farmers are happy to pay the costs involved with giving analgesics to cattle" – only 36.3% agreed- and a significant majority (65.3%) agreed that even though "farmers would like cattle to receive analgesia … cost is a major issue", the farmers' survey, as shown in Table D, suggests that their willingness to pay is higher than veterinarians' estimate. These findings have prompted Huxley and Whay (2006, 2007; see also Hudson et.al 2008) to question the weight of cost as a barrier and put it forward that "it is important [that veterinarians] offer a range of costed analgesic treatment protocols for painful procedures and conditions" (ibid, p. 128).

Table D. Vet vs Farmer usage of pain relief, pain scores and ideas about acceptable cost

Disease/ Condition (Cattle)	Vet use (%)	Farmer willingness to use (%)		Vet Pain Perception (1-10 score with 10 the highest)	Farmer Pain Perception (1-10 score with 10 the highest)	Recognition of benefits %		Farmer acceptable cost (Percentage)				
		During treatment	After treatment					<£5	£5-£10	£11-£20	£21-£35	£36-£50
Claw Amputation	61	97	75.3	10	9	Farmers 93.8	Vets 98.5	25.7	40.3	25.3	6.7	2
C-Section	68	98.6	62.3	9	9			18.1	35	28	12.8	6.2
Surgical Castration of Calves	4.6	78.6	25.1	5	7			59.8	31.8	7.8	0.6	0
Disbudding	1.7	88.4	13.9	8	7			74.5	21.4	3.4	0.6	0.2

130. Another two findings that confuse are that according to Thomsen et.al (2012), only 27% of farmers reported cost as a barrier and 64% of farmers and 85.1% of veterinarians agreed that "it makes economic sense to use analgesics for cows". There are indications, for example, that there are financial benefits to the use of analgesics (Faulkner and Weary 2000; O'Callaghan-Lowe et.al 2004), and yet "untreated diseased animals and inadequate recording currently make up the highest failure rate in Government animal welfare inspections" (FAWC 2012, p. 62).

131. **Short vs. Long term use of analgesics** Notwithstanding what has been said above about the issue of cost, Hudson et.al (2008:130) do state that with regard to the use of pain relief for long term conditions cost remains the major barrier.

132. **RESEARCH GAP Adding another column to Table D that showed the real costs of pain relief for those diseases or conditions would give granularity to the issue of cost as a barrier. What explains the differences in acceptability of costs? It would be important to understand to what extent these misconceptions about farmers' willingness to pay for pain relief affect vets' decisions to offer pain relief options. If cost is a barrier only to a certain extent, what else explains the current patchy and inconsistent use of pain relief?**

133. **RESEARCH GAP How are decisions about pain relief for long-term or chronic conditions made and how are these decision trees different in their rationale?**

134. **Farmer-Vet relations** In our interpretation, what these findings point out is the important role of the farmer-vet relationship in the decision-making process about pain relief. In this relation two issues emerge. The first is the aspect of knowledge. On the one hand, 62% of the farmers surveyed by Huxley and Whay (2007, p. 191) reported not knowing enough about controlling pain in cattle and 53% of them also stated that "veterinary surgeons do not discuss controlling pain in cattle with farmers enough". On the other hand, as we said above, this lack of discussion could be related to veterinarians' own perceptions about farmer attitudes to the provision and cost of pain relief; but it could also be related to veterinarians' own sense of lacking knowledge. Indeed, when surveyed by Whay and Huxley (2008, p. 55-57), less than half of the vets "felt that they had adequate knowledge" with regard to pain relief for cattle. This was evident for example in the fact that the most often cited product that vets reported to use for local anaesthetics was "not one that is licensed for use in food-producing

animals"; in that "the average practitioner usually had just this one anaesthetic agent" and in that "practitioners cite as analgesics products that are not known to have analgesic properties". Over half of the veterinarians responding to Hudson's et.al (2008, p. 126) survey felt that this inadequate knowledge was due to a "lack of readily available information on the subject". These findings suggest non-regulatory interventions such as improving vet knowledge of available products; improving and standardising scoring systems to assess the degree of pain involved in disease and improving vet facilitation of information about a wide range of pain relief options to farmers. Indeed, farmers surveyed by Misch et.al 2007 in Canada stated that "vets should take the initiative to educate their clients about the options for pain relief management" (p.1249).

135. The second issue is vet's perception of farmers. As Huxley and Whay (2007, p. 191) explain, vets take "differences in the acceptable cost of analgesic treatment specified by farmers of different types, genders or geographical location … into account when they are considering the use of analgesics".

136. **RESEARCH GAP More needs to be known about the farmer-vet interface with regards to provision of pain relief. Indications about how vets decide to provide pain relief options and encourage their use need to be further explored.**

137. **Cultural capital** However, there are procedures in which the vet is not necessarily involved, such as piglet castration; calf disbudding or cattle dehorning. Other sets of complexities arise in these cases. Although not practised in the UK, evidence from farmers in Belgium (Tuyttens et.al 2012) suggests that there are several considerations other than cost with regards to the castration of piglets that are worth noting in order to point out possible evidence gaps in the UK and with respect to other procedures on which very little social research has been done. These considerations include ideas about a condition being "normal" or part of what is expected to happen; ideas about a procedure and the way to perform it being part of the traditional tasks and skills of a farmer; ideas about the balance between the effects of enduring a strong pain for a very short instant vs. undergoing a stressful procedure for a much longer time, such as that involved in anaesthesia administration; concerns about handler and animal safety during the administration of pain relief be that anaesthesia or analgesia; and concerns about harmful residues and consequently, about withdrawal periods. The extent to which adopting pain relief practices involves developing new skills or making structural changes in the farm is another factor that needs examining.

138. **RESEARCH GAP More needs to be known about the role of culturally embedded ideas in decisions about provision of pain relief. What cultural scripts circulate about this? How do they vary for different conditions, procedures or diseases? How do they vary for different sectors or farming systems?**

139. Moreover, though, despite giving higher pain scores than vets to most diseases and procedures, it appears that farmers are "less likely to use analgesics" than vets (Thomsen et.al 2012, p. 94). Although Thomsen's et.al (2012) research was based in Denmark and differences according to the diversity of regulations ought to be taken into account, Vaarst et al's (2002) findings about the influence of cultural factors on pain provision decision-making are worth stressing as indicative of research gaps, moreover as they are the only to be based on in-depth semi-structured interviews rather than on surveys.

In their research about the farmers' decision-making process with regards to the treatment of mastitis, Vaarst et.al (2002) found that rather than it being a straightforward decision-making tree, various considerations interact with one another in ways that can be different in each farm and even in each day in the same farm, and that considerations are not necessarily hierarchical. However, despite this malleability, the rationale behind pain provision decisions appeared relatively uniform across their sample and this suggests that a similar approach, even if it encounters a different reality, could be as illustrative of the case in the UK.

What they found was that although all severely affected cows would receive treatment, the decision to treat mild mastitis is far more complex as it includes, in first instance, considerations about the cow: for example, whether it is regarded as a good tempered cow, one that the farmer wants to keep at any cost or rather, one that the farmer is not that bothered about; whether the cow has or not a history of mastitis; and whether it has or is yet to fulfil the farmers' expectations; and whether the cow has or not a high milk yield, a good quality udder or a favourable reproduction status (p.995).

At another level, the decision about treatment was also related to the herd situation: whether the cow could be replaced if euthanasia seemed a better option, the status of the milk quota, etc. Most interesting though was the influence of cultural scripts. Indeed, another option in the treatment of mastitis is teat blinding (which is also relevant when considering the issue of antibiotic resistance). However, teat blinding was found to be perceived as evidence of "bad farmer management" and as reflecting or not "complete control of the health situation". Accordingly, issues of pride and reputation were integral to the decision of treating mastitis.

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SUMMARY

Farmers' decisions about providing pain relief to their animals understandably vary according to procedure or condition. However, these decisions are also strongly influenced by farmers' relationships with vets, by vets' decisions about offering pain relief options, by on-farm structural limitations (such as separate pens, for example), farmers' feelings of empathy with their animals and farmers' management priorities at a herd level. Shared notions about pain and pain belief that circulate within farming cultures also have a role to play. This complex decision tree is nevertheless under-researched from a social science perspective.

EVIDENCE

- The decision to provide pain relief has traditionally been associated with perceptions about how painful a condition/procedure is and how beneficial the anaesthesia/analgesia will be for the animal's welfare and productivity. In general, farmers have a high degree of awareness of the level of pain associated with some procedures/conditions. Levels of agreement about the benefits of pain relief are also high.
- However, research shows that provision of pain relief by farmers and vets is inconsistent. The available social science indicates that the decision tree involves more than simply perceptions about pain and the benefits of pain relief.
- Several myths circulating in the farming community about animal pain influence farmers' decisions to provide pain relief to their animals, for example that young animals experience less pain than adults that a certain level of pain is necessary to prevent movement and that analgesics mask signs of further deterioration.
- Although cost is often mentioned as a barrier to providing pain relief, the evidence indicates that farmers are more willing to pay for pain relief than vets expect. Cost, however, is more relevant in the decision if the pain relief is required for longer periods.
- The farmer-vet relationship emerges as an important vector. There is the suggestion that vet perceptions about farmers' attitudes to pain relief and willingness to pay for it affect their decision to offer pain relief options. Vet knowledge about pain relief options is also a key factor in vets' decision to offer options for pain relief to farmers.
- Farmers' decision to provide pain relief is also affected by ideas that circulate in farming cultures about some painful conditions being 'normal' and certain practices being part of what farmers 'have always done'; about the balance between causing short term pain and subjecting the animal to long periods of stress in order to receive pain relief; about the skills and risks associated with providing pain relief and about harmful residues and withdrawal periods. Other ideas about the individual animal, about the well-being and productivity of the herd and feelings of empathy and attachment are also part of the decision-making process.

RESEARCH GAPS

- More evidence on actual use of pain relief by farmers and vets needs to be collected. The surveys that have been done allow variations such as "in less than

25% of cases", "in over half the cases", but do not offer any insight into what explains these variations on-site.

- The apparent incongruity between perception of pain, willingness to pay and actual use warrants further investigation.
- The incidence of vet perceptions about farmers' attitudes to and willingness to pay for pain relief on their offering of pain relief options ought to be investigated
- The evidence indicates that the decision to provide pain relief is very complex. Research is needed to understand this complexity and how it varies across sector, system and procedures/conditions.
- It is necessary to understand how issues of empathy, sense of professionalism, cultural ideas about pain and pain relief ownership (whether the farmer and vet think it is their decision) affect the provision of pain relief.

IX. TREATING LAMENESS IN DAIRY COWS AND SHEEP

EVIDENCE REVIEW

140. During the last four decades lameness has become an animal welfare issue: on the one hand it has become a veterinary concern (Sibley 2013, p. 92), while on the other it has also become an issue that the public feels concerned about. Retailers and other food-chain actors have thus begun to consider lameness levels as criteria in farm assurance. However, the levels of lameness in dairy cattle in 2009 were reported as largely similar to those in 1990 (FAWC 2009, p. 5). The situation is similar with regards to sheep, the other most concerned sector: the farmer-estimated levels in 2004 (10%) revealed a worsening situation since 1994, when the estimated average was 8.4% (FAWC 2011, p.2).

141. Lameness is a complex issue. It is understood by farmers and keepers but their assessment of the acceptable thresholds for lameness prevalence in flocks and herds is increasingly at odds with knowledge of animal suffering. Traditional advisory methods have not been effective for two reasons. First, because they have addressed the technical solutions rather than the cultural thresholds (both in terms of acceptable prevalence and in terms of impact upon productivity) which relate to broader issues of farming practice and peer group behaviour. Second, because they have targeted the treatment of individual animals rather than broader more holistic flock/herd management issues.

142. Dealing with lameness implies different kinds of decisions at different moments: there is first the ability of farmers to accurately *recognise* lameness in their herds or flocks (King and Green, 2011). But being able to tell if a cow is lame is different from making the decision to *treat* her, and it is also different to *acknowledging* lameness as a welfare issue. Moreover, even if lameness is thought of as a welfare issue, this is not the same as considering it a *priority*. Furthermore, acting on lameness implies not only providing *treatment* but also the decision to make structural or managerial changes so as to *prevent* lameness. And finally, animal welfare science also reveals that the animal's interest is better served if treatment is followed by other measures that aid a prompt *recovery*. Dealing with lameness then, implies a series of decision and action moments from identifying, acknowledging and prioritising, to treating, nursing and preventing.

143. This short review fleshes out two ideas, embedded in the culture of farming practices, which have an impact on farmers' decisions about lameness. In first instance, it seems that farmers decide when lameness becomes an issue that requires treatment at the herd and not at the individual level; and this idea, in turn, appears to be related to the traditional notion that a certain level of lameness is acceptable and inevitable as part of farming: this idea has an important effect on practices around the treatment of lameness. We further argue that these ideas persist in a cycle of mutual reinforcement with their associated practices: ideas determine decisions about treatment, and in turn the choice of treatment reinforces those ideas. Research should seek to understand their dynamic in more detail and generate interventions able to work at both levels: ideas and practices.

144. **Acknowledging lameness as a welfare issue** Despite "an increased awareness of lameness in sheep" (FAWC 2011), as well as amongst dairy farmers, research still reports a general lack of awareness of the broader welfare and economic consequences of high lameness levels. In their extensive literature review, Potterton et al (2011) identify lack of perception of lameness as a major problem to be a significant barrier to the take-up of remedial action. Leach et al. (2010a) have also pointed out that "the level of farmers' awareness of current evidence and recommended lameness management strategies is patchy".

145. Several issues appear to be linked to farmers not thinking of lameness as a problem that requires early treatment. One issue, at least for dairy farmers, is that lameness is not always perceived as having a significant impact upon productivity. Farmers, it is claimed, do not always see or perceive the economic costs of lameness when compared, for example, with mastitis (Bell et.al 2006). Research evidence points to clear economic consequences for farm profitability, affecting fertility (Socha et al. 2002), yield and farm management costs (Green et al. 2002). DairyCo estimate the costs of lameness in dairy cows in the following manner:

> "The average cost of an incidence of lameness, in terms of treatment costs, loss of yield and potential for shortened productive life of the cow may be in the region of £180; at current levels of incidence this could equate to a financial loss of nearly £15,000 for an average-sized herd, or to put it another way, a cost of well over 1p per litre of milk produced on the farm. Lameness can also lead to other herd health problems; it can be a cause of or complicate mastitis, metabolic illnesses and fertility problems due to impeded mobility and behaviour" (DairyCo 2010, unpaginated).

146. However, despite figures having been available for at least 25 years and being constantly updated, Leach et.al (2010a, p. 315) found that "only 30% of farmers were willing or able to make an estimate of the cost of lameness". Leach et.al (2010a) have noted that differences in estimates may have generated some level of distrust in the figures, thus affecting their potential impact as motivators for change.

147. **RESEARCH GAP: There is clearly a need to help farmers become aware of the significant cost implications of lameness and trust their legitimacy. An intervention designed to address this issue would need to know more about and be aware of the issue of legitimacy, trust and transparency (Leach et.al 2010a) with regard to estimates of the economic cost of lameness as well as of the economic benefits of different approaches to treatment.**

148. A second issue behind farmers' lack of preoccupation (and therefore action), is that a certain level of lameness has traditionally been accepted by animal keepers as a largely inevitable part of the production system (DairyCo 2013). There are two key words worth stressing in this statement. On the one hand, there is the matter of tradition. Lameness is an evolving condition associated with different lesions that have changed and emerged as farming practices and structures have transformed (Sibley 2013); but the traditional acceptance of lameness as normal seems to prevail. On the other, there is the issue of lameness being perceived as inevitable or very difficult to control. This view, we would argue, is not disconnected from ideas about the treatment of lameness. Research has shown that individualised and early treatment is most effective in terms of curing the condition and also in terms of representing a better use of time and money

(Wassink et.al 2010). However, these treatments imply an early and individualised approach: in the case of sheep, for example, catching the animal and treating it within 3 days of the first symptoms. But for farmers, lameness becomes an issue at the herd and not the individual level (more on this later) and they have expressed a preference for herd level treatments (Green et.al 2012) that can be more easily integrated into the day-to-day activities in the farm and can become "more part of the routine" (Leach et.al 2010a).

149. Therefore, there is reason to expect that these "more demanding" (at least in the view of farmers) but more effective treatments reinforce farmers' idea that lameness is something that is very hard to control in terms of both the practicality and the effectiveness of treatment. If farmers insist, as some of them do (Green et.al 2012), on treating lameness in sheep in ways that research has found to be associated with an increased prevalence of lameness, such as routine foot trimming and foot bathing (Kaler and Green 2009), it is likely that their perception of lameness as being very hard to control will prevail. As Green et.al (2012, p. 70) suggest, farmers express a preference for these suboptimal treatments because they "reinforce their current management" even if the evidence suggests a different approach. Our argument is that the prevalence of suboptimal treatments and of notions about how feasible it is to control lameness might lead to high levels of acceptance of lameness as normal and therefore to poor awareness of the condition as a welfare issue that requires early treatment. In other words, choice of treatment and recognition of lameness as a problem are part of a cycle that reinforces inadequate farming practices and unhelpful ideas that circulate within the farming culture. There is a path-dependency here that needs to be broken both at the cultural and the technical level.

150. **RESEARCH GAP: What cultural scripts circulate about lameness amongst farmers? How is this acceptability of lameness understood: in terms of number of affected animals, or in terms of severity of lesions? How do these ideas relate to notions of tradition, and to deep-seated management practices? How do these ideas vary for each sector? How best to intervene into this unhelpful cycle of mutually reinforcing practices and culture?**

151. This preference for herd level treatments is also connected to farmers' ideas about *when* lameness is a problematic rather than a 'normal' situation. There is on the one hand evidence that farmers and vets score the existence of lameness (whether an animal is lame or not) in different ways. Whay et al's study (2003) demonstrates that there is often little if any correspondence between farmer estimates of lameness and veterinary assessments of what can often be classed as severe lameness and suffering. Although some of these discrepancies could relate to methodological issues within the studies, as Leach et.al (2010a) acknowledge, what is important to underline is that *when* an animal is lame is a contested matter and this has an effect on farmers' awareness of the problem and on their decisions to provide treatment.

152. On the other hand, being able to identify individual animals as lame is crucial to estimates of prevalence because different perceptions about individual lameness will have an impact on overall estimates. Evidence suggests that farmers and keepers often under-estimate lameness levels in their herds and flocks (Wells et al. 1993; Whay 2002; King and Green 2011). In one study, Leach et al (2010a) report that 90% of sampled dairy farmers failed to consider lameness a "major" problem in their herd although the

average prevalence was around 36%. In their study of sheep farmers, Green et.al (2012, p. 68) found that although farmers were fairly accurate and only modestly under-estimated lameness, "once the prevalence of lameness was >9% farmers tended to under-estimate the prevalence of lameness by approximately 2%". They also found that not all farmers would include "sheep lame at score 2 in an estimate of prevalence". What seems to emerge is that under-estimation of lameness at the herd level is related to different views of when an animal is lame, and this, in turn, is related to different views of when an animal requires treatment: while scientists and vets would treat individual animals at the earliest stages, it seems that farmers wait longer.

153. **RESEARCH GAP: Farmers' understanding of lameness as a problematic issue at the herd level rather than in terms of individual animals needs to be better understood. The same applies for farmers' own parameters to judge when an animal is lame and when it requires treatment.**

154. **Treating lameness** With lameness having multiple causes, both infectious and non-infectious, it is of course crucial that farmers can identify and diagnose them correctly. Research shows that farmers will act differently depending on the diagnosis. For example, farmers are more likely to call a vet in the case of infectious lesions, with the vet's presence and advice being an important vector for the animal's recovery (Clements et.al. 2002). The evidence shows that most farmers recognise the different lesions that make cows and sheep lame; however, there remains concern about issues of mis-diagnosis and therefore about providing an inappropriate treatment particularly in the absence of a veterinarian. As Clements et.al. (2002) show, the decision to call the vet is made less often and this represents a risk of mis-diagnosis given farmers' tendency to use the term "footrot" as a generic descriptor when seeking advice over the phone.

155. **RESEARCH GAP: These issues of farmers using the wrong terminology, failing to identify lesions correctly, being less inclined to call the vet and running the risk of giving the wrong treatment suggest the merit of further research into the farmer – vet relationship with regard to the treatment of lameness. Which knowledge and communication dynamics take place between farmers and vets and can they be improved?**

156. However, even when farmers are made aware of the issue, there remains a reluctance to give it priority as a welfare concern to be addressed by any remedial action. Drawing on their work for the *Healthy Feet Project*, Leach and Whay (2008) report on the very low take-up levels amongst dairy farmers for participation in a scheme to improve identified on-farm lameness. The reasons given by the surveyed farmers for their non-participation in the Healthy Feet project are summarised in Figure 2 below. Again, it is worth noting how farmers' ideas about more effective treatments being more demanding in terms of time and cost emerge clearly as the stronger reasons not to participate, despite the evidence showing that treating lameness has financial and time-management benefits. The third most significant reason not to participate, "there is no lameness problem in the farm", relates again to the purchase that the notion of lameness as acceptable/normal has on farmers' willingness to treat and prioritise it.

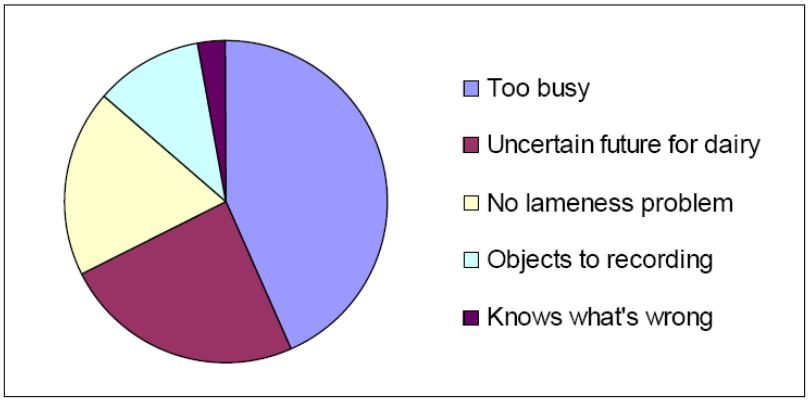


Figure 2. Reasons given by farmers for their non-participation in the Healthy Feet Project (Bristol University)
Source: Leach and Whay (2008)

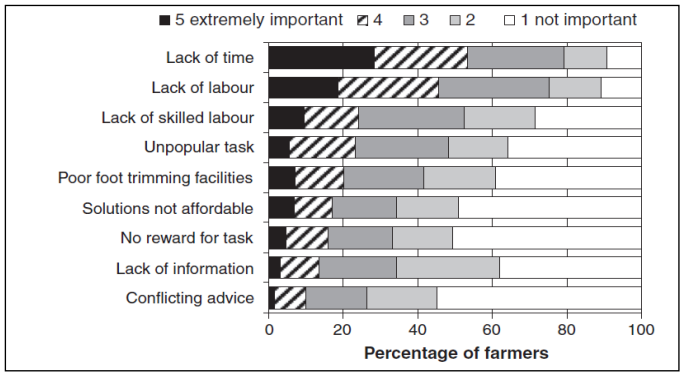
157. Moreover, a lengthy programme of treatment and lameness reduction can only be embarked on if farmers have confidence in the long-term future and economic viability of their herd. In today's economic and animal health environment, this is becoming increasingly difficult to sustain. The impact of lameness on the profitability of sheep enterprises is well documented. Defra lists the more common impacts as: decline in body condition, lower lambing percentage, lower lamb birth weight and hence reduced lamb viability, reduced growth rate in lambs, reduced milk production, lower fertility in rams and reduced wool growth (Defra 2003). Again, the issue here is less to do with recognition of lameness *per se* (Kaler and Green 2008) and more to do with the contestable acceptance of some degree of lameness as inevitable, particularly in upland flocks where high levels of regular observation, animal catching and treatment are difficult. Kaler and Green (2008) acknowledge that the skills are there: "Our study indicates that farmers have the skills to follow the current advice about how to minimise lameness in sheep and prevent the spread of footrot among their flock" (p. 9). However, recognizing lameness is one thing, deciding to catch a sheep and treat it is another. Kaler and Green's (2008) research shows that farmers will wait until either a sufficient number of animals are affected or until individual cases become severe before they catch and treat animals, reiterating the prevalence of a flock or group approach rather than an individualized one.

158. **RESEARCH GAP: It is crucial to better understand the reinforcing cycle that seems to emerge from our interpretation of the literature whereby the choice of treatment reinforces unhelpful culturally embedded ideas about lameness as acceptable and hard to control and vice versa in order that it can be addressed more effectively.**

159. **Raising awareness of and motivating farmer to reduce lameness** From the various attempts to raise farmer awareness of lameness in both cattle and sheep, we might identify a number of key strategic approaches. These include:

- Helping farmers become aware of the potentially significant cost implications of lameness in terms of raised culling rates, inability to transport animals to slaughter and so on
- Developing effective and easy-to-use herd/flock lameness scoring techniques
- Improving on-farm record keeping as a tool to monitor progress and make the benefits of treatment more visible.

160. The issue of the additional costs in time and money as a barrier to lameness control, which, as we have noted, is contradicted by the evidence and seems to be related to the reinforcement of their practices and ideas about lameness, emerges clearly in farmers' listing of barriers as represented in Figure 3.



Source: Leach et al, 2010b / Whay and Main (2009)

Figure 3. Percentage of farmers considering the suggested barriers to lameness control "extremely important" to "not important"

161. When asked about motivators, it is significant that they too seem to relate to culturally embedded ideas about farming practices. However, the cultural ideas behind motivations for treating lameness are of a different order and seem to be in contradiction with the ideas that seemingly act as barriers. The ideas around which the motivators seem to revolve are about professional pride, empathy and reputation. In our interpretation, this reinforces the need to better understand the cultural scripts of farming practices of lameness control.

Table E. Percentage of farmers in agreement with the suggested motivators to lameness control

Motivator	Percentage of farmers in agreement
Pride in herd health	83
Feeling sorry for the cow	81
Concern about public image	72
Lame cows cost money	71
Feeling guilty	70
Concern about effect on assurance scheme	44
Desire to be better than other farms	38

Source Leachet.al 2010b

162. Potterton et.al (2011, p. 96) also mention that when asked about factors "that farmers thought would motivate other farmers to take more action to control lameness [replies] were split evenly between economic drivers and other suggestions. The most frequently cited economic drivers were more information on the costs associated with lameness, and an increase in milk price. The most frequently cited of the other suggestions were discussion groups"

163. **RESEARCH GAP How do conflicting ideas circulate and stabilise while contradictory. How are decisions taken and how do they balance out these contradictions?**

164. More innovative risk-based approaches to encourage adoption (for example Bell et al. 2009) have not proved particularly successful despite the sound evidence behind them. For Whay and Main (2012), the explanation for this lies in the advisory style adopted: "It is clear that when management tools are introduced without consideration of the target audience some resistance is inevitable" (p. 282). They promote a 'social marketing' approach (Whay and Main 2009). Arguing that "Farmers are more likely to take action if they perceive benefits, although, this change may be limited by any perceived barriers", Whay and Main advocate a process of 'normalisation', through collective social action, where reducing lameness becomes 'normal' practice amongst farmers. In this, they stress the role of farmer ownership both of the method and the goal: "A farmer-owned approach is not only much more likely to be effective but recognises that farmers hold skills and knowledge about farming that most veterinary surgeons and advisors will never be able to duplicate" (p. 285).

165. Main and Mullan (2012) have also emphasised the importance of this shift in communication strategies, which requires a shift too "in the attitude amongst advisors and veterinary surgeons" (p.108). In the Healthy Feet Project, for example, instead of feeding lameness reports back to farmers in terms of overall percentages of lame cows, researchers presented farmers with a list of cows that were "likely to benefit from treatment" (p.110), an approach that was perceived as more constructive and less confrontational.

166. **RESEARCH GAP More needs to be known about other participatory, collective and practice-based efforts to affect actions and decisions, and about their lessons and potential.**

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SUMMARY

This review suggests that the barriers to lameness control revolve around culturally embedded ideas and farming practices that are mutually reinforcing. These ideas include notions that lameness is very hard to control, that a certain level of lameness is normal and un-avoidable and that lameness is a welfare issue at the herd and not the individual level. Motivation to address lameness is also related to ideas about professional pride, empathy and reputation. Research is required both to facilitate interventions that address this connection between practices and ideas and to embed, through changes in the choice of treatment, the understanding that lameness is treatable.

EVIDENCE

- Dealing with lameness implies different decisions: from recognising to treating it; from acknowledging it as an issue that requires treatment to considering it a welfare priority; from preventing it, to supporting animals in their recovery after treatment.
- The evidence indicates that these decisions are affected by at least two ideas that circulate in farming communities: that lameness becomes an issue that requires treatment at the herd and not the individual level and that a certain level of lameness is acceptable and inevitable.
- The evidence suggests that these ideas persist in a cycle of mutual reinforcement with their associated practices: ideas determine decisions about treatment and in turn the choice of treatment reinforces those ideas.
- Research shows that although the cost of lameness is well-documented and information is accessible, there are issues of trust, legitimacy and transparency that prevent this information from acting as a motivator for farmers.
- The idea that a certain level of lameness is acceptable is linked to the idea that lameness is very difficult to control. The choice of suboptimal treatments reinforces these ideas.
- That farmers judge when lameness becomes an issue that requires treatment at the herd and not the individual level is linked to differences between farmers and vets in judging when a cow is lame. The farmer-vet relationship is key in various ways and at different points of the decision map described above, but further research is needed to understand these nuances, for example in farmers' choice of suboptimal treatment.
- While farmers' lists of barriers to treating lameness include the perceived inaccuracy of the evidence of economic impact of the condition, their lists of drivers point to cultural and emotional issues such as professional pride, empathy and concern for reputation.

RESEARCH GAPS

- The feelings about the legitimacy and transparency of the available figures on the cost of lameness need to be investigated in order for cost to act as a motivator
- The cycle of culturally embedded ideas about a certain level of lameness being acceptable and about lameness being hard to control, which are reinforced by farmers' choice of treatment needs to be thoroughly understood

- Farmers' motivations to choose suboptimal treatments need to be better understood
- Farmers' relations with other actors, such as foot-trimmers and how they affect farmers' approach to lameness, choice of treatment and how they relate to circulating cultural ideas about lameness also requires further investigation
- Research is needed on the cultural ideas about lameness that circulate in farming communities and on motivators related to professional pride, empathy and reputation.

X. CONCLUDING REMARKS: TOWARDS A SOCIAL SCIENCE RESEARCH AGENDA

167. This research review has revealed the limitations of a social science approach that, in seeking to identify pathways to behavioural change, focuses predominantly on the behaviour of individuals both as the main agent of change and as the empirical focus of research. Such an approach not only risks de-contextualising individual behaviour from both the social, cultural and ecological context within which farming activities take place; it also limits the role of social science to that of easing the process of adopting and implementing pre-established policy outputs. It is our firm belief that social science should be fully integrated into the initial framing of policy issues and into the definition of research questions and problems. In this way, social science would have a place and role that was less of a facilitator of policy delivery and more as an active participant in the framing and definition of policy problems and evidence requirements from the beginning. This would allow the evidence base and the policy options to more fully account for the relational social and cultural context within which behaviours take place, as well as benefit from more robust methodologies for investigating different research questions.

168. This research has drawn attention to not only specific social science research gaps within identified fields of animal welfare farmer behaviour but also to what we interpret as an overly behavioural focus within existing Defra social science approaches. In doing so we argue that widening the scope of the social science evidence in order to reframe the issue of behaviour as one of social interactions rather than of individual attitudes, values and beliefs, would provide a fuller understanding of why farmers take actions and decisions in one way or another, and therefore underpin a more robust evidence base on which to develop complementary policies and interventions. We call for a more robust approach to the understanding of farmer behaviour which moves away from a focus on individual behaviour as outcome (where individual actions and decisions reflect individual values and attitudes) to a more interactive focus which takes into account the dynamic social, cultural, professional, economic and political relations within which individual farmers live and work.

169. We draw attention in this review to the very complex socio-professional context within which British farmers tend to operate. This review has captured the weight of these relational contexts in farmers' actions and decisions. In particular, we have noted the role of culturally embedded ideas about farming and farming practices. We have reviewed evidence on how these ideas inform farmers' actions and decisions, and noted how farmers' practices reinforce in turn these circulating notions. We have also examined evidence on how these culturally embedded notions affect farmers' sense of professional pride, personal and professional identity, and of being part of a community. However, there is little research and understanding of these issues in policy design. In particular, we have argued that an evidence base that understood the role of cultural capital and cultural scripts in farmers' behaviours, and acknowledged that what is at stake for farmers is also about safekeeping this sense of identity and professional community, would provide a sounder base for policy interventions aimed at achieving long-term cultural change. We recommend that these culturally embedded notions constitute a first area of social science research and are explored on a case-study/issue basis in accordance with issue priorities identified by the Animal Welfare Directorate,

while highlighting the potential of extending this research into other farmer-based policy areas within the Department.

170. This review has also identified how farmers' actions and decisions are not disconnected from their relations with those individuals and organisations that also give shape to farming practices and cultures, such as veterinarians, assurance scheme advisors, agricultural technicians, retailers and professional bodies. In particular, we have pointed out farmer –vet relations as a crucial vector in farmers' engagement with animal welfare. Another very salient set of relations is that between the farmer and the wider network of audit and inspection that frames industrial farming practices. We argue that generating long-lasting cultural change is potentially a matter of affecting these wider social relations that should hence become a focus of social science investigation. We recommend that these wider relationships constitute two more areas of social science research, with the farmer-vet relations scoped at issue level and the farmer-audit regime interface at a wider level. We also press the potential of designing interventions aimed at affecting these relationships on the basis of an evidence base that better understood how they operate, what are their nuances across sectors and farming systems, and how they relate to wider processes affecting the social role of farmers, the nature and effects of regulation, the cultural status of animal welfare as a public good, and the multiple relationships of power in which farmers are immersed.

171. Besides these three main areas of research identified above in this report (farmer-cultural community; farmer-vets and farmer-audit regime), on the basis of our expertise and building on the literature reviewed we suggest another five themes that could be valuably integrated into a social science research agenda. The first of these would seek to better understand society's interpretations of animal welfare as a social issue. A second area would explore the lessons to be gained from collective, dialogue-based and participatory approaches to farmer behavioural change such as communities of practice and farmer learning groups (see for example Reference List 6).

172. Although the focus of this review has been on farmers and farmer behaviour, we strongly believe that a greater understanding of human/animal relations and of the role of affective and empathetic considerations on farmers' actions and decisions needs to be more closely integrated as another task within a social science research agenda. The research reviewed in this study demonstrates that the affective relations performed daily between farmer and farm animal play a critical role in determining the acceptability or otherwise of practices aimed at improving animal welfare, and therefore we recommend this as a third theme for a social science research agenda.

173. This review has also identified the critical role of information, information flow and information availability in the behaviour of farmers with respect to farm animal welfare. A great deal of information is routinely collected as part of statutory or accepted farm management often for diverse and multiple agencies. Some of this information could be used in a more collective and aggregate way to feedback benchmark figures to farmers against which to self-assess their own practices. Additional information, of potential use to the management and self-assessment of welfare practices, is not always collected or shared in a systematic way and could be made more generally available. We believe a fourth theme to be about the need to understand from a social science perspective the record-keeping demands on farmer, how farmers and other actors collect, use, share and disseminate information of husbandry practice and how

this relates to their relations with those agencies that supply and/or require this information. Finally, a fifth theme would seek to draw comparative lessons from research on farmer behaviours with respect to voluntary measures such as those introduced under agri-environment and/or climate change adaptation and mitigation policy initiatives.

174. In conclusion, projecting social science into Defra's animal welfare evidence would imply
    - reframing the issue of farmer behaviour not as an effect determined by the individual's mind but as an instance of social relations
    - placing social science at the moment of defining and understanding social problems and policy issues and not only at the moment of implementing interventions, with the added benefit of widening the scope of the evidence base and the breadth of approaches and methodologies on which it stands
    - focusing the research effort on the wider relations that influence farmers' actions and decisions, particularly with communities where specific culturally embedded ideas about farming practices and identities circulate on the one hand, as well as with the other actors such as vets, advisors, retailers and inspection regimes, on the other
    - re-directing the intervention effort towards affecting those wider relations so that changes in farming practices are a collective rather than individual matter
    - considering a social science research agenda that focused on the three main areas identified through the reviewed case studies but also integrated the other five themes described above.

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